| Name: | Date: |
|---|---|
| Topic: | Class: |

| Main Ideas/Questions | Notes/Examples |
|---|---|

## EQUATION

A mathematical statement that uses an equal sign (=) to show that 2 expressions are equal.

## SOLVING equations

Many equations include a variable. To solve an equation means to find the value of the variable that makes the equation true. Solve the equations below using mental math. Explain by checking your answer.

| | Equation | Solution | Why? |
|---|---|---|---|
| 1. | $x-2=7$ | $x=9$ | $9-2=7$ |
| 2. | $6+k=8$ | $k=2$ | $6+2=8$ |
| 3. | $9=w+5$ | $w=4$ | $9=4+5$ |
| 4. | $10=p-3$ | $p=13$ | $10=13-3$ |
| 5. | $2=8-a$ | $a=6$ | $2=8-6$ |

## INVERSE OPERATIONS

The equations above are called **one-step equations** and can also be solved using **inverse operations**. Inverse operations undo each other. Examples of inverse operations:

Addition ⟷ Subtraction

Multiplication ⟷ Division

**Steps to solve a one-step equation using inverse operations:**

1. Locate the variable.
2. Determine the operation tied to the variable.
3. Use inverse operations on both sides of the equal sign to solve.
4. Check your solution!

## SOLVING EQUATIONS with addition

**Addition Property of Equality:** When you add the same number to both sides of an equation, the two sides remain equal.

**6.** $x-3=4$

$+3 \quad +3$

$x=7$

$7-3=4$

$4=4$ ✓

**7.** $15=k-8$

$+8 \quad +8$

$23=k$

$15=23-8$

$15=15$ ✓

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**8.** $n-10=4$

$+10 \quad +10$

$n=14$

$14-10=4$

$4=4$ ✓

**9.** $27=c-9$

$+9 \quad +9$

$36=c$

$27=36-9$

$27=27$ ✓

## SOLVING EQUATIONS
*with subtraction*

**Subtraction Property of Equality:** When you subtract the same number from both sides of an equation, the two sides remain equal.

**10.** $x+5=16$

$-5 \quad -5$

$x=11$

$11+5=16$

$16=16$ ✓

**11.** $13=9+r$

$-9 \quad -9$

$4=r$

$13=9+4$

$13=13$ ✓

**12.** $15=3+m$

$-3 \quad -3$

$12=m$

$15=3+12$

$15=15$ ✓

**13.** $w+6=34$

$-6 \quad -6$

$w=28$

$28+6=34$

$34=34$ ✓

## MIXED
*addition & subtraction*

**14.** $n-8=6$

$+8 \quad +8$

$n=14$

$14-8=6$

$6=6$ ✓

**15.** $a+9=17$

$-9 \quad -9$

$a=8$

$8+9=17$

$17=17$ ✓

**16.** $14+z=16$

$-14 \quad -14$

$z=2$

$14+2=16$

$16=16$ ✓

**17.** $7=k-13$

$+13 \quad +13$

$20=k$

$7=20-13$

$7=7$ ✓

**18.** $f-13=16$

$+13 \quad +13$

$f=29$

$29-13=16$

$16=16$ ✓

**19.** $25=16+r$

$-16 \quad -16$

$9=r$

$25=16+9$

$25=25$ ✓

**20.** $y+18=51$

$-18 \quad -18$

$y=33$

$33+18=51$

$51=51$ ✓

**21.** $9=h-7$

$+7 \quad +7$

$16=h$

$9=16-7$

$9=9$ ✓

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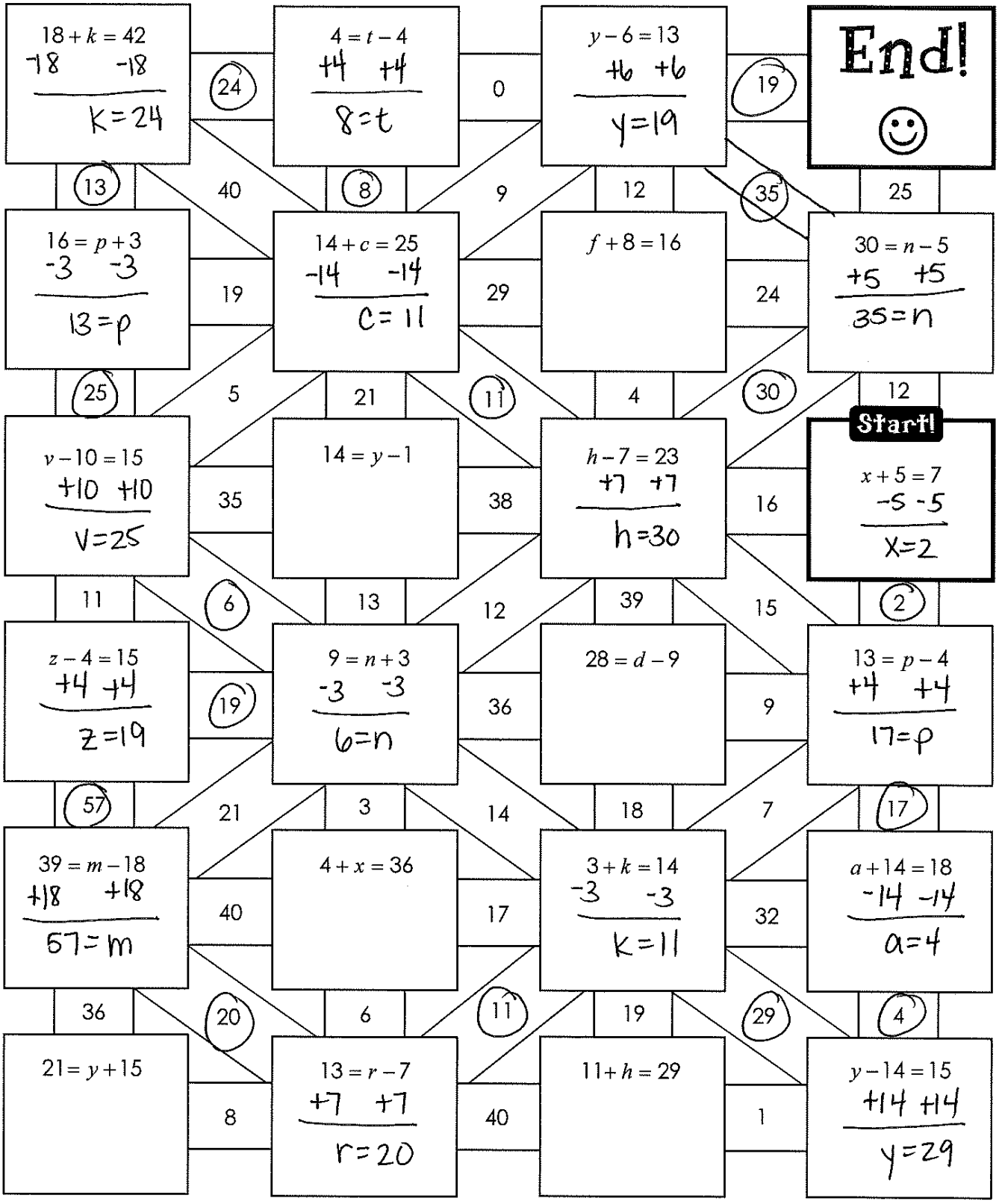
# ONE-STEP EQUATIONS MAZE!

(using addition or subtraction)

**Directions:** Solve and check each equation. Use your solutions to navigate through the maze.

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**Name:** _____ **Unit 5:** Equations & Inequalities

**Date:** _____ **Per:** _____ **Homework 1:** Solving One-Step Equations (using addition/subtraction)

**Directions:** Determine whether the given value is a solution to the equation.

**1.** $k+19=51;\ k=32$

$32+19=51$

$51=51$ ✓

Yes

**2.** $16=x-27;\ x=43$

$16=43-27$

$16=16$ ✓

Yes

**3.** $28-m=17;\ m=9$

$28-9=17$

$19\neq 17$

No

**4.** $y+19=27;\ y=8$

$8+19=27$

$27=27$ ✓

Yes

**5.** $19=p+3;\ p=22$

$19=22+3$

$19\neq 25$

No

**6.** $4+r=15;\ r=11$

$4+11=15$

$15=15$ ✓

Yes

**Directions:** Solve each equation using inverse operations. Check your solution.

**7.** $a-8=9$

$+8\ +8$

$a=17$

$17-8=9$

$9=9$ ✓

**8.** $v+13=15$

$-13\ -13$

$v=2$

$2+13=15$

$15=15$ ✓

**9.** $16=n-24$

$+24\ +24$

$40=n$

$16=40-24$

$16=16$ ✓

**10.** $c-9=16$

$+9\ +9$

$c=25$

$25-9=16$

$16=16$ ✓

**11.** $11+k=18$

$-11\ -11$

$k=7$

$11+7=18$

$18=18$ ✓

**12.** $15=w-7$

$+7\ +7$

$22=w$

$15=22-7$

$15=15$ ✓

**13.** $g-38=13$

$+38\ +38$

$g=51$

$51-38=13$

$13=13$ ✓

**14.** $27=16+x$

$-16\ -16$

$11=x$

$27=16+11$

$27=27$ ✓

**15.** $y-9=24$

$+9\ +9$

$y=33$

$33-9=24$

$24=24$ ✓

**16.** $r+5=14$

$-5\ -5$

$r=9$

$9+5=14$

$14=14$ ✓

**17.** $15=m+11$

$-11\ -11$

$4=m$

$15=4+11$

$15=15$ ✓

**18.** $a-9=32$

$+9\ +9$

$a=41$

$41-9=32$

$32=32$ ✓

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| Name: | Date: |
|---|---|
| Topic: | Class: |

| Main Ideas/Questions | Notes/Examples | |
|---|---|---|
| **SOLVING EQUATIONS** *with multiplication* | **Multiplication Property of Equality:** When you multiply both sides of an equation by the same number, the two sides remain equal. | |
| | 1. 3 · $\frac{x}{3} = 9$ · 3<br>$x = 27$<br>$\frac{27}{3} = 9$<br>$9 = 9$ ✓ | 2. 11 · $\frac{k}{11} = 5$ · 11<br>$k = 55$<br>$\frac{55}{11} = 5$<br>$5 = 5$ ✓ |
| | 3. 6 · $\frac{m}{6} = 7$ · 6<br>$m = 42$<br>$\frac{42}{6} = 7$<br>$7 = 7$ ✓ | 4. 8 · $2 = \frac{c}{8}$ · 8<br>$16 = c$<br>$2 = \frac{16}{8}$<br>$2 = 2$ ✓ |
| **SOLVING EQUATIONS** *with division* | **Division Property of Equality:** When you divide both sides of an equation by the same number, the two sides remain equal. | |
| | 5. $\frac{6y}{6} = \frac{24}{6}$<br>$y = 4$<br>$6(4) = 24$<br>$24 = 24$ ✓ | 6. $\frac{30}{2} = \frac{2f}{2}$<br>$15 = f$<br>$30 = 2(15)$<br>$30 = 30$ ✓ |
| | 7. $\frac{8n}{8} = \frac{8}{8}$<br>$n = 1$<br>$8(1) = 8$<br>$8 = 8$ ✓ | 8. $\frac{63}{7} = \frac{7p}{7}$<br>$9 = p$<br>$63 = 7(9)$<br>$63 = 63$ ✓ |
| **MIXED** *multiplication & division* | 9. $\frac{x}{2} = 7$ · 2<br>$x = 14$<br>$\frac{14}{2} = 7$<br>$7 = 7$ ✓ | 10. $\frac{48}{8} = \frac{8n}{8}$<br>$6 = n$<br>$48 = 8(6)$<br>$48 = 48$ ✓ |

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**11.** $\frac{3c}{3} = \frac{27}{3}$

$c = 9$

$3(9) = 27$

$27 = 27$ ✓

**12.** $12 = \frac{z}{2} \cdot 2$

$24 = z$

$12 = \frac{24}{2}$

$12 = 12$ ✓

**13.** $\frac{v}{5} = 3 \cdot 5$

$v = 15$

$\frac{15}{5} = 3$

$3 = 3$ ✓

**14.** $\frac{36}{9} = \frac{9y}{9}$

$4 = y$

$36 = 9(4)$

$36 = 36$ ✓

**15.** $14 = \frac{a}{6} \cdot 6$

$84 = a$

$14 = \frac{84}{6}$

$14 = 14$ ✓

**16.** $\frac{5p}{5} = \frac{40}{5}$

$p = 8$

$5(8) = 40$

$40 = 40$ ✓

**17.** $\frac{34}{2} = \frac{2w}{2}$

$17 = w$

$34 = 2(17)$

$34 = 34$ ✓

**18.** $\frac{r}{4} \cdot 4 = 11 \cdot 4$

$r = 44$

$\frac{44}{4} = 11$

$11 = 11$ ✓

## CHECKING SOLUTIONS

**Determine whether the given value is a solution to the equation.**

**21.** $7p = 84;\ p = 12$

$7(12) = 84$

$84 = 84$ ✓

Yes

**22.** $6 = \frac{a}{3};\ a = 18$

$6 = \frac{18}{3}$

$6 = 6$ ✓ Yes

**23.** $\frac{k}{3} = 24;\ k = 78$

$\frac{78}{3} = 24$

$26 \neq 24$ No

**24.** $42 = 3m;\ m = 14$

$42 = 3(14)$

$42 = 42$ ✓

Yes

**25.** $16x = 80;\ x = 5$

$16(5) = 80$

$80 = 80$ ✓

Yes

**26.** $\frac{c}{2} = 8;\ c = 10$

$\frac{10}{2} = 8$

$5 \neq 8$ No

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# WHY DID THE CAT SIT ON THE COMPUTER?

**Directions:** Solve each equation. Show all work on a separate sheet of paper.
Find matching answers within each set. One will have a letter and the other a number.
Write the letter in the matching numbered box at the bottom of the page.

## SET 1

| | | | | | |
|---|---|---|---|---|---|
| **Y.** | $x-15=21$ | $X=36$ | **7.** | $3x=15$ | $X=5$ |
| **H.** | $x+4=13$ | $X=9$ | **10.** | $\frac{x}{4}=9$ | $X=36$ |
| **A.** | $12=7+x$ | $X=5$ | **21.** | $2=\frac{x}{7}$ | $X=14$ |
| **K.** | $x-15=45$ | $X=60$ | **15.** | $8x=72$ | $X=9$ |
| **E.** | $30=x+16$ | $X=14$ | **3.** | $\frac{x}{12}=5$ | $X=60$ |

## SET 2

| | | | | | |
|---|---|---|---|---|---|
| **N.** | $\frac{a}{8}=3$ | $a=24$ | **12.** | $a+13=20$ | $a=7$ |
| **T.** | $54=9a$ | $a=6$ | **16.** | $11=a+9$ | $a=2$ |
| **P.** | $4=\frac{a}{4}$ | $a=16$ | **13.** | $a-4=20$ | $a=24$ |
| **E.** | $10a=20$ | $a=2$ | **14.** | $20=a+14$ | $a=6$ |
| **O.** | $35=5a$ | $a=7$ | **6.** | $a-7=9$ | $a=16$ |

## SET 3

| | | | | | |
|---|---|---|---|---|---|
| **E.** | $k+7=61$ | $k=54$ | **17.** | $5k=5$ | $k=1$ |
| **M.** | $13+k=14$ | $k=1$ | **9.** | $\frac{k}{7}=6$ | $k=42$ |
| **O.** | $6=k-2$ | $k=8$ | **2.** | $32=4k$ | $k=8$ |
| **T.** | $k-5=13$ | $k=18$ | **5.** | $\frac{k}{3}=18$ | $k=54$ |
| **E.** | $30=k-12$ | $k=42$ | **1.** | $2=\frac{k}{9}$ | $k=18$ |

## SET 4

| | | | | | |
|---|---|---|---|---|---|
| **E.** | $\frac{m}{6}=8$ | $m=48$ | **19.** | $m-11=17$ | $m=28$ |
| **O.** | $60=4m$ | $m=15$ | **8.** | $12=m+8$ | $m=4$ |
| **N.** | $3m=12$ | $m=4$ | **4.** | $35=m-13$ | $m=48$ |
| **E.** | $5=\frac{m}{6}$ | $m=30$ | **20.** | $m-4=9$ | $m=13$ |
| **U.** | $\frac{m}{7}=4$ | $m=28$ | **18.** | $26=m+11$ | $m=15$ |
| **S.** | $2m=26$ | $m=13$ | **11.** | $m-12=18$ | $m=30$ |

## ANSWER:

| 1. | 2. | | 3. | 4. | 5. | 6. | | 7. | 8. | | 9. | 10. | 11. | | 12. | 13. | | 14. | 15. | 16. | | 17. | 18. | 19. | 20. | 21. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T | O | | K | E | E | P | | A | N | | E | Y | E | | O | N | | T | H | E | | M | O | U | S | E | ! |

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**Name:** _____ **Unit 5:** Equations & Inequalities

**Date:** _____ **Per:** _____ **Homework 2:** Solving One-Step Equations (using multiplication/division)

**Directions:** Determine whether the given value is a solution to the equation.

**1.** $\frac{x}{4} = 28;\ x = 116$

$\frac{116}{4} = 28$

$29 \neq 28$ No

**2.** $17k = 51;\ k = 3$

$17(3) = 51$

$51 = 51$ ✓ Yes

**3.** $78 = 8p;\ p = 9$

$78 = 8(9)$

$78 \neq 72$ No

**4.** $24 = \frac{a}{4};\ a = 92$

$24 = \frac{92}{4}$

$24 \neq 23$ No

**5.** $\frac{w}{7} = 4;\ w = 28$

$\frac{28}{7} = 4$

$4 = 4$ ✓ Yes

**6.** $16z = 48;\ z = 3$

$16(3) = 48$

$48 = 48$ ✓ Yes

**Directions:** Solve each equation using inverse operations. Check your solution.

**7.** $\frac{x}{8} = 10$ · 8

$x = 80$

$\frac{80}{8} = 10$

$10 = 10$ ✓

**8.** $\frac{7v}{7} = \frac{14}{7}$

$v = 2$

$7(2) = 14$

$14 = 14$ ✓

**9.** $\frac{30}{5} = \frac{5p}{5}$

$6 = p$

$30 = 5(6)$

$30 = 30$ ✓

**10.** $3 = \frac{r}{9}$ · 9

$27 = r$

$3 = \frac{27}{9}$

$3 = 3$ ✓

**11.** $\frac{12m}{12} = \frac{60}{12}$

$m = 5$

$12(5) = 60$

$60 = 60$ ✓

**12.** $\frac{a}{4} = 3$ · 4

$a = 12$

$\frac{12}{4} = 3$

$3 = 3$ ✓

**13.** $\frac{57}{3} = \frac{3f}{3}$

$19 = f$

$57 = 3(19)$

$57 = 57$ ✓

**14.** $6 = \frac{z}{6}$ · 6

$36 = z$

$6 = \frac{36}{6}$

$6 = 6$ ✓

**15.** $\frac{k}{7} = 13$ · 7

$k = 91$

$\frac{91}{7} = 13$

$13 = 13$ ✓

**16.** $\frac{6h}{6} = \frac{84}{6}$

$h = 14$

$6(14) = 84$

$84 = 84$ ✓

**17.** $\frac{c}{2} = 10$ · 2

$c = 20$

$\frac{20}{2} = 10$

$10 = 10$ ✓

**18.** $\frac{117}{9} = \frac{9s}{9}$

$13 = s$

$117 = 9(13)$

$117 = 117$ ✓

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| Name: | Date: |
|---|---|
| Topic: | Class: |

| Main Ideas/Questions | Notes/Examples |
|---|---|

# MIXED
## One-Step
# EQUATIONS

**Use inverse operations and the properties of equality to solve each equation. Check each solution.**

**1.** $4x = 28$

$\frac{4}{4} \quad \frac{4}{4}$

$x = 7$

$4(7) = 28$

$28 = 28$ ✓

**2.** $25 = k + 12$

$-12 \quad -12$

$13 = k$

$25 = 13 + 12$

$25 = 25$ ✓

**3.** $\frac{r}{5} = 2$ ·5

$r = 10$

$\frac{10}{5} = 2$

$2 = 2$ ✓

**4.** $v - 14 = 5$

$+14 \quad +14$

$v = 19$

$19 - 14 = 5$

$5 = 5$ ✓

**5.** $12 = 7 + m$

$-7 \quad -7$

$5 = m$

$12 = 7 + 5$

$12 = 12$ ✓

**6.** $\frac{16}{8} = \frac{8p}{8}$

$2 = p$

$16 = 8(2)$

$16 = 16$ ✓

**7.** $7 = \frac{w}{6}$ ·6

$42 = w$

$7 = \frac{42}{6}$

$7 = 7$ ✓

**8.** $1 + a = 7$

$-1 \quad -1$

$a = 6$

$1 + 6 = 7$

$7 = 7$ ✓

**9.** $g - 4 = 21$

$+4 \quad +4$

$g = 25$

$25 - 4 = 21$

$21 = 21$ ✓

**10.** $6n = 72$

$\frac{6}{6} \quad \frac{6}{6}$

$n = 12$

$6(12) = 72$

$72 = 72$ ✓

**11.** $\frac{c}{4} = 4$ ·4

$c = 16$

$\frac{16}{4} = 4$

$4 = 4$ ✓

**12.** $18 = s - 35$

$+35 \quad +35$

$53 = s$

$18 = 53 - 35$

$18 = 18$ ✓

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# TRANSLATING One-Step EQUATIONS

***KEY WORDS FOR = :**

is
equals
results in

**Translate each equation using a variable, then solve to the right.**

| | |
|---|---|
| **13.** "The sum of a number and 7 is 16." <br> $n+7=16$ | **Solve:** <br> $n+7=16$ <br> $-7\ \ -7$ <br> $\boxed{n=9}$ |
| **14.** "24 equals the product of a number and 8." <br> $24=8n$ | **Solve:** <br> $\frac{24}{8}=\frac{8n}{8}$ <br> $\boxed{3=n}$ |
| **15.** "14 decreased from a number is 59." <br> $n-14=59$ | **Solve:** <br> $n-14=59$ <br> $+14\ \ +14$ <br> $\boxed{n=73}$ |
| **16.** "The quotient of a number and 7 is 8." <br> $\frac{n}{7}=8$ | **Solve:** <br> $7\cdot\frac{n}{7}=8\cdot 7$ <br> $\boxed{n=56}$ |
| **17.** "A number increased by 9 results in 14." <br> $n+9=14$ | **Solve:** <br> $n+9=14$ <br> $-9\ \ -9$ <br> $\boxed{n=5}$ |
| **18.** "27 is the difference of a number and 6." <br> $27=n-6$ | **Solve:** <br> $27=n-6$ <br> $+6\ \ +6$ <br> $\boxed{33=n}$ |
| **19.** "3 times a number equals 72." <br> $3n=72$ | **Solve:** <br> $\frac{3n}{3}=\frac{72}{3}$ <br> $\boxed{n=24}$ |
| **20.** "A number divided by 5 is 15." <br> $\frac{n}{5}=15$ | **Solve:** <br> $5\cdot\frac{n}{5}=15\cdot 5$ <br> $\boxed{n=75}$ |

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# ONE-STEP EQUATIONS Relay Puzzle!

**Directions:** Solve each equation. Use the arrows to guide you through the page. Use your answer from the previous problem to fill in the blank in the next problem. Work through the page until you reach the end.

**START!**

**1** $c - 18 = 6$

$+18 \quad +18$

$c = 24$

**2** $\frac{8k}{8} = \frac{\boxed{24}}{8}$

$k = 3$

**3** $10 = x + \boxed{3}$

$-3 \quad -3$

$7 = x$

**4** $7 \cdot 5 = \frac{m}{\boxed{7}} \cdot 7$

$35 = m$

**5** $w - 25 = \boxed{35}$

$+25 \quad +25$

$w = 60$

**6** $\frac{\boxed{60}}{12} = \frac{12a}{12}$

$5 = a$

**7** $y + 3 = \boxed{5}$

$-3 \quad -3$

$y = 2$

**8** $2 \cdot \frac{r}{\boxed{2}} = 9 \cdot 2$

$r = 18$

**9** $34 = z - \boxed{18}$

$+18 \quad +18$

$52 = z$

**10** $\frac{13h}{13} = \frac{\boxed{52}}{13}$

$h = 4$

**11** $\boxed{4} = v - 4$

$+4 \quad +4$

$8 = v$

**12** $5 \cdot \frac{n}{5} = \boxed{8} \cdot 5$

$n = 40$

**13** $x + 31 = \boxed{40}$

$-31 \quad -31$

$x = 9$

**14** $\frac{\boxed{9}\,f}{9} = \frac{54}{9}$

$f = 6$

**15** $8 \cdot \boxed{6} = \frac{p}{8} \cdot 8$

$48 = p$

**END!**

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**Name:** _____ **Unit 5:** Equations & Inequalities

**Date:** _____ **Per:** _____ **Homework 3:** Solving One-Step Equations (all operations)

**Directions:** Solve each equation. Check all solutions.

**1.** $x-3=8$

$+3 \quad +3$

$x=11$

$11-3=8$

$8=8$ ✓

**2.** $35=5m$

$\frac{35}{5}=\frac{5m}{5}$

$7=m$

$35=5(7)$

$35=35$ ✓

**3.** $\frac{p}{4}=12$ · 4

$p=48$

$\frac{48}{4}=12$

$12=12$ ✓

**4.** $23=r-14$

$+14 \quad +14$

$37=r$

$23=37-14$

$23=23$ ✓

**5.** $\frac{w}{2}=14$ · 2

$w=28$

$\frac{28}{2}=14$

$14=14$ ✓

**6.** $19=6+k$

$-6 \quad -6$

$13=k$

$19=6+13$

$19=19$ ✓

**7.** $6n=60$

$\frac{6n}{6}=\frac{60}{6}$

$n=10$

$6(10)=60$

$60=60$ ✓

**8.** $s+6=23$

$-6 \quad -6$

$s=17$

$17+6=23$

$23=23$ ✓

**9.** $5=\frac{a}{9}$ · 9

$45=a$

$5=\frac{45}{9}$

$5=5$ ✓

**10.** $v-35=17$

$+35 \quad +35$

$v=52$

$52-35=17$

$17=17$ ✓

**11.** $3c=78$

$\frac{3c}{3}=\frac{78}{3}$

$c=26$

$3(26)=78$

$78=78$ ✓

**12.** $52=z+16$

$-16 \quad -16$

$36=z$

**Directions:** Translate each equation, then solve. Show all work on the back of this paper.

| Words | Equation | Solution |
|---|---|---|
| **13.** "9 subtracted from a number is 40" | $n-9=40$ | $n=49$ |
| **14.** "3 equals the quotient of a number and 54." | $3=\frac{n}{54}$ | $n=162$ |
| **15.** "The total of a number and 7 is 25." | $n+7=25$ | $n=18$ |
| **16.** "40 is the product of a number and 4." | $40=4n$ | $n=10$ |
| **17.** "A number divided by 8 is 9." | $\frac{n}{8}=9$ | $n=72$ |
| **18.** "The difference of a number and 2 is 15." | $n-2=15$ | $n=17$ |

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| Name: | Date: |
|---|---|
| Topic: | Class: |

| Main Ideas/Questions | Notes/Examples |
|---|---|

# RATIONAL Equations

**Recall the steps below to solve a one-step equation:**

1. Locate the variable.
2. Determine the operation tied to the variable.
3. Use **inverse operations** on both sides of the equal sign to solve.
4. Check your solution!

## SET 1: Equations with Decimals

**Solve each equation. Check all solutions.**

**1.** $x + 7.8 = 15.23$

$-7.8 \quad -7.8$

$x = 7.43$

$7.43 + 7.8 = 15.23$

$15.23 = 15.23$ ✓

**2.** $30.58 = w - 2.913$

$+2.913 \quad +2.913$

$33.493 = w$

$30.58 = 33.493 + 2.913$

$30.58 = 30.58$ ✓

**3.** $r - 52.7 = 29.38$

$+52.7 \quad +52.7$

$r = 82.08$

$82.08 - 52.7 = 29.38$

$29.38 = 29.38$ ✓

**4.** $\frac{2.5k}{2.5} = \frac{62}{2.5}$

$k = 24.8$

$2.5(24.8) = 62$

$62 = 62$ ✓

**5.** $13.8 = \frac{n}{7.2}$ $\cdot(7.2)$

$99.36 = n$

$13.8 = \frac{99.36}{7.2}$

$13.8 = 13.8$

**6.** $\frac{40}{0.08} = \frac{0.08p}{0.08}$

$500 = p$

$40 = 0.08(500)$

$40 = 40$

**Translate each equation, then solve.**

**7.** "16.8 subtracted from a number is 70.03."

$n - 16.8 = 70.03$

$+16.8 \quad +16.8$

$n = 86.83$

**8.** "The quotient of a number and 16.65 is 3.8."

$\frac{n}{16.65} = 3.8 \cdot (16.65)$

$n = 63.27$

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# SET 2:

Equations with Fractions

**Solve each equation. Check all solutions.**

**9.** $x - \frac{3}{10} = \frac{1}{4}$

$+\frac{3}{10} \quad +\frac{3}{10}$

$x = \frac{11}{20}$

$\frac{11}{20} - \frac{3}{10} = \frac{1}{4}$

$\frac{1}{4} = \frac{1}{4}$ ✓

**10.** $\frac{1}{6} + p = 2\frac{4}{9}$

$\frac{1}{6} + p = \frac{22}{9}$

$-\frac{1}{6} \quad -\frac{1}{6}$

$p = \frac{41}{18}$

$p = 2\frac{5}{18}$

$\frac{1}{6} + 2\frac{5}{18} = 2\frac{4}{9}$

$2\frac{4}{9} = 2\frac{4}{9}$ ✓

**11.** $f - 1\frac{5}{6} = 6\frac{1}{2}$

$f - \frac{11}{6} = \frac{13}{2}$

$+\frac{11}{6} \quad +\frac{11}{6}$

$f = \frac{25}{3}$

$f = 8\frac{1}{3}$

$8\frac{1}{3} - 1\frac{5}{6} = 6\frac{1}{2}$

$6\frac{1}{2} = 6\frac{1}{2}$ ✓

**12.** $7\frac{1}{12} = c + 1\frac{7}{8}$

$\frac{85}{12} = c + \frac{15}{8}$

$-\frac{15}{8} \quad -\frac{15}{8}$

$\frac{125}{24} = c$ ; $c = 5\frac{5}{24}$

$7\frac{1}{12} = 5\frac{5}{24} + 1\frac{7}{8}$

$7\frac{1}{12} = 7\frac{1}{12}$ ✓

**13.** $m \div \frac{6}{5} = \frac{15}{4} \cdot \frac{6}{5}$

$m = \frac{9}{2}$

$m = 4\frac{1}{2}$

$4\frac{1}{2} \div \frac{6}{5} = \frac{15}{4}$

$\frac{15}{4} = \frac{15}{4}$ ✓

**14.** $v \div 1\frac{5}{6} = 1\frac{1}{2}$

$\frac{11}{6} v \div \frac{11}{6} = \frac{3}{2} \cdot \frac{11}{6}$

$v = \frac{11}{4}$

$v = 2\frac{3}{4}$

$2\frac{3}{4} \div 1\frac{5}{6} = 1\frac{1}{2}$

$1\frac{1}{2} = 1\frac{1}{2}$ ✓

**Recall:** To divide by a fraction, multiply by its reciprocal!

**15.** $\frac{1}{3}a = \frac{5}{12} \cdot 3$

$a = \frac{5}{4}$

$a = 1\frac{1}{4}$

$\frac{1}{3}(1\frac{1}{4}) = \frac{5}{12}$

$\frac{5}{12} = \frac{5}{12}$ ✓

**16.** $5\frac{5}{9} = \frac{4}{7}k$

$\frac{7}{4} \cdot \frac{50}{9} = \frac{4}{7}k \cdot \frac{7}{4}$

$\frac{175}{18} = k$

$9\frac{13}{18} = k$

$5\frac{5}{9} = \frac{4}{7}(9\frac{13}{18})$

$5\frac{5}{9} = 5\frac{5}{9}$ ✓

**Translate each equation, then solve.**

**17.** "Two-fifths of a number is 30."

$\frac{5}{2} \cdot \frac{2}{5}n = 30 \cdot \frac{5}{2}$

$n = 75$

**18.** "The sum $\frac{2}{3}$ and number is $1\frac{5}{8}$."

$\frac{2}{3} + n = 1\frac{5}{8}$

$\frac{2}{3} + n = \frac{13}{8}$

$-\frac{2}{3} \quad -\frac{2}{3}$

$n = \frac{23}{24}$

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# WHAT DID THE OCEAN SAY TO THE BEACH?

**Directions:** Solve each equation. Show all work on a separate sheet of paper.
Find matching answers within each set. One will have a letter and the other a number.
Write the letter in the matching numbered box at the bottom of the page.

## SET 1

| | | | | | |
|---|---|---|---|---|---|
| **T.** | $x + 11.95 = 30.55$ | $X = 18.6$ | **4.** | $4x = 25.8$ | $X = 6.45$ |
| **N.** | $\frac{x}{4.8} = 7.45$ | $X = 35.76$ | **15.** | $21.91 = x + 8.16$ | $X = 13.75$ |
| **E.** | $35.75 = 1.3x$ | $X = 27.5$ | **9.** | $\frac{x}{124} = 0.15$ | $X = 18.6$ |
| **I.** | $9.8 + x = 14.15$ | $X = 4.35$ | **12.** | $x - 6.72 = 17.22$ | $X = 23.94$ |
| **U.** | $x - 2.09 = 7.61$ | $X = 9.7$ | **7.** | $\frac{x}{0.28} = 154.5$ | $X = 43.26$ |
| **H.** | $10.54 = 4.09 + x$ | $X = 6.45$ | **17.** | $12.5 = \frac{x}{2.2}$ | $X = 27.5$ |
| **S.** | $\frac{x}{25.2} = 0.95$ | $X = 23.94$ | **11.** | $32.98 = 3.4x$ | $X = 9.7$ |
| **G.** | $27.46 = x - 15.8$ | $X = 43.26$ | **1.** | $x - 22.8 = 12.96$ | $X = 35.76$ |
| **A.** | $8.25 = 0.6x$ | $X = 13.75$ | **8.** | $3.8x = 16.53$ | $X = 4.35$ |

## SET 2 (Give each answer as a mixed number in simplest form.)

| | | | | | |
|---|---|---|---|---|---|
| **J.** | $a + \frac{1}{2} = 1\frac{1}{3}$ | $a = \frac{5}{6}$ | **13.** | $a - 1\frac{1}{6} = 1\frac{3}{4}$ | $a = 2\frac{11}{12}$ |
| **T.** | $\frac{3}{4}a = 2\frac{1}{3}$ | $a = 3\frac{1}{9}$ | **5.** | $a \div 1\frac{1}{8} = \frac{4}{5}$ | $a = \frac{9}{10}$ |
| **I.** | $\frac{7}{10} = a - \frac{1}{5}$ | $a = \frac{9}{10}$ | **18.** | $2\frac{1}{4} = a + \frac{1}{2}$ | $a = 1\frac{3}{4}$ |
| **W.** | $1\frac{1}{2} + a = 1\frac{7}{8}$ | $a = \frac{3}{8}$ | **6.** | $a \div 1\frac{1}{5} = 3\frac{3}{4}$ | $a = 4\frac{1}{2}$ |
| **O.** | $a - \frac{2}{5} = \frac{9}{20}$ | $a = \frac{17}{20}$ | **10.** | $\frac{1}{2}a = \frac{5}{12}$ | $a = \frac{5}{6}$ |
| **T.** | $a \div 1\frac{1}{4} = 2\frac{1}{3}$ | $a = 2\frac{11}{12}$ | **2.** | $\frac{1}{4} = a - \frac{3}{5}$ | $a = \frac{17}{20}$ |
| **N.** | $\frac{2}{3} = a - 3\frac{5}{6}$ | $a = 4\frac{1}{2}$ | **16.** | $2\frac{1}{3} = a + \frac{11}{15}$ | $a = 1\frac{3}{5}$ |
| **D.** | $2\frac{1}{2} = 1\frac{3}{7}a$ | $a = 1\frac{3}{4}$ | **3.** | $1\frac{1}{6} = \frac{3}{8}a$ | $a = 3\frac{1}{9}$ |
| **V.** | $a \div \frac{4}{5} = 2$ | $a = 1\frac{3}{5}$ | **14.** | $\frac{5}{4} = a \div \frac{3}{10}$ | $a = \frac{3}{8}$ |

## ANSWER:

| 1. | 2. | 3. | 4. | 5. | 6. | 7. | | 8. | 9. | | 10. | 11. | 12. | 13. | | 14. | 15. | 16. | 17. | 18. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N | O | T | H | I | N | G | | I | T | | J | U | S | T | | W | A | V | E | D | ! |

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Name: _____ **Unit 5:** Equations & Inequalities

Date: _____ Per: _____ **Homework 4:** One-Step Rational Equations

**Directions:** Solve each equation. Show your work and check your solution.

**1.** $p + 7.058 = 21.3$

$-7.058 \quad -7.058$

$p = 14.242$

$14.242 + 7.058 = 21.3$

$21.3 = 21.3$ ✓

**2.** $0.4x = 21.8$

$\frac{0.4}{0.4} \quad \frac{}{0.4}$

$x = 54.5$

$0.4(54.5) = 21.8$

$21.8 = 21.8$ ✓

**3.** $18.7 = c - 129.5$

$+129.5 \quad +129.5$

$148.2 = c$

$18.7 = 148.2 - 129.5$

$18.7 = 18.7$ ✓

**4.** $\frac{n}{7.68} = 20.55$ $\cdot(7.68)$ $\cdot(7.68)$

$n = 157.824$

$\frac{157.824}{7.68} = 20.55$

$20.55 = 20.55$ ✓

**5.** $6.125 = 0.35z$

$\frac{6.125}{0.35} \quad \frac{0.35z}{0.35}$

$17.5 = z$

$6.125 = 0.35(17.5)$

$6.125 = 6.125$ ✓

**6.** $1\frac{1}{2} + x = 4\frac{5}{6}$

$\frac{3}{2} + x = \frac{29}{6}$

$-\frac{3}{2} \quad -\frac{3}{2}$

$x = \frac{10}{3}$

$x = 3\frac{1}{3}$

$1\frac{1}{2} + 3\frac{1}{3} = 4\frac{5}{6}$

$\frac{3}{2} + \frac{10}{3} = \frac{29}{6}$

$\frac{29}{6} = \frac{29}{6}$ ✓

**7.** $\frac{1}{2}y = 4\frac{2}{5}$

$\frac{2}{1} \cdot \frac{1}{2}y = \frac{22}{5} \cdot \frac{2}{1}$

$y = \frac{44}{5}$

$y = 8\frac{4}{5}$

$\frac{1}{2}\left(8\frac{4}{5}\right) = 4\frac{2}{5}$

$\frac{1}{2}\left(\frac{44}{5}\right) = \frac{22}{5}$

$\frac{22}{5} = \frac{22}{5}$ ✓

**8.** $k - 2\frac{5}{6} = 6\frac{5}{12}$

$k - \frac{17}{6} = \frac{77}{12}$

$+\frac{17}{6} \quad +\frac{17}{6}$

$k = \frac{37}{4}$

$k = 9\frac{1}{4}$

$9\frac{1}{4} - 2\frac{5}{6} = 6\frac{5}{12}$

$\frac{37}{4} - \frac{17}{6} = \frac{77}{12}$

$\frac{77}{12} = \frac{77}{12}$ ✓

**9.** $5\frac{9}{10} = w + 2\frac{5}{6}$

$\frac{59}{10} = w + \frac{17}{6}$

$-\frac{17}{6} \quad -\frac{17}{6}$

$\frac{46}{15} = w$

$3\frac{1}{15} = w$

$5\frac{9}{10} = 3\frac{1}{15} + 2\frac{5}{6}$

$\frac{59}{10} = \frac{46}{15} + \frac{17}{6}$

$\frac{59}{10} = \frac{59}{10}$ ✓

**10.** $1\frac{1}{3} = a \div 1\frac{3}{4}$

$\frac{7}{4} \cdot \frac{4}{3} = a \div \frac{7}{4} \cdot \frac{7}{4}$

$\frac{7}{3} = a$

$2\frac{1}{3} = a$

$1\frac{1}{3} = 2\frac{1}{3} \div 1\frac{3}{4}$

$\frac{4}{3} = \frac{7}{3} \div \frac{7}{4}$

$\frac{4}{3} = \frac{7}{3} \cdot \frac{4}{7}$

$\frac{4}{3} = \frac{4}{3}$ ✓

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| Name: | Date: |
|---|---|
| Topic: | Class: |

| Main Ideas/Questions | Notes/Examples |
|---|---|

# REAL-WORLD
One-Step Equations

**Use the steps below to guide you in writing equations to solve problems.**

| ❶ CHOOSE A VARIABLE | ❷ WRITE AN EQUATION | ❸ SOLVE! |
|---|---|---|
| What are you trying to find? Assign this to a variable if the problem doesn't give it. | Look for key words for the operation! | Be sure to check your answer! |

## SET 1:
Addition & Subtraction

**Directions:** Define a variable, write an equation, and give the solution.

**1.** There were 16 golfers eliminated from a tournament after the first round. If there are 38 golfers remaining, write an solve an equation to find the initial number of golfers.

$g - 16 = 38$
$+16 \quad +16$
$g = 54$

$54 - 16 = 38$
$38 = 38$ ✓

**Variable:** g = golfers
**Equation:** $g - 16 = 38$
**Solution:** 54 golfers

**2.** Manny got a puppy for his birthday. After one year, the puppy gained 28 pounds and now weighs 71 pounds. Write an equation to find how much the puppy weighed when Manny got him.

$W + 28 = 71$
$-28 \quad -28$
$W = 43$

$43 + 28 = 71$
$71 = 71$ ✓

**Variable:** W = weight
**Equation:** $W + 28 = 71$
**Solution:** 43 pounds

**3.** There were $c$ cups of flour in a jar. If Ari uses $2\frac{3}{4}$ cups to make a cake, and there are $1\frac{1}{2}$ cups left, find $c$.

$c - 2\frac{3}{4} = 1\frac{1}{2}$
$c - \frac{11}{4} = \frac{3}{2}$
$+\frac{11}{4} \quad +\frac{11}{4}$
$c = \frac{17}{4}$ $\quad c = 4\frac{1}{4}$

$4\frac{1}{4} - 2\frac{3}{4} = 1\frac{1}{2}$
$\frac{17}{4} - \frac{11}{4} = \frac{3}{2}$
$\frac{3}{2} = \frac{3}{2}$ ✓

**Variable:** C = cups
**Equation:** $c - 2\frac{3}{4} = 1\frac{1}{2}$
**Solution:** $4\frac{1}{4}$ cups

## SET 2:
Multiplication & Division

**4.** Sam's car averages 24 miles per gallon. How many gallons will he use for a 300-mile road trip?

$\frac{24g}{24} = \frac{300}{24}$
$g = 12.5$

$24(12.5) = 300$
$300 = 300$ ✓

**Variable:** g = gallons
**Equation:** $24g = 300$
**Solution:** 12.5 gallons

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## SET 3:
Mixed Equations

**5.** Jordan and Alex are playing a video game. Alex scored three times as many points than Jordan did. If Jordan scored 87 points, how many points did Alex score?

$87 \cdot \frac{p}{87} = 3 \cdot 87$

$p = 261$

$\frac{261}{87} = 3$

$3 = 3$ ✓

**Variable:** p = points

**Equation:** $\frac{p}{87} = 3$

**Solution:** 261 points

**6.** Lana spent $59.40 on stamps to mail her wedding invitations. If each stamp costs $0.55 and each invitation got one stamp, how many invitations did she send?

$\frac{0.55w}{0.55} = \frac{59.40}{0.55}$

$w = 108$

$0.55(108) = 59.40$

$59.40 = 59.40$ ✓

**Variable:** w = wedding invitations

**Equation:** $0.55w = 59.40$

**Solution:** 108 invitations

**7.** Melissa is a realtor. She sold 29 homes in 2019. If this was 7 fewer homes than she sold in 2018, write an equation to find $h$, the number of homes she sold in 2018.

$29 = h - 7$

$+7 \quad +7$

$36 = h$

**Variable:** h = homes

**Equation:** $29 = h - 7$

**Solution:** 36 houses

**8.** Katya sold fruit baskets for $16 each for a school fundraiser. If she raised $368, find the number of fruit baskets she sold.

$\frac{16b}{16} = \frac{368}{16}$

$b = 23$

**Variable:** b = baskets

**Equation:** $16b = 368$

**Solution:** 23 baskets

**9.** Mrs. Johnson deposited a check for $175 in her checking account. If the balance in the account is now $724, find the balance in her account before the deposit.

$b + 175 = 724$

$-175 \quad -175$

$b = 549$

**Variable:** b = balance

**Equation:** $b + 175 = 724$

**Solution:** $549

**10.** Remi ran a 5 mile race and averaged 9.2 minutes per mile. If $t$ represents her final time in minutes, find $t$.

$5 \cdot \frac{t}{5} = 9.2 \cdot 5$

$t = 46$

**Variable:** t = time

**Equation:** $\frac{t}{5} = 9.2$

**Solution:** 46 min

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Name: _____ **Unit 5:** Equations & Inequalities

Date: _____ Per: _____ **Homework 5:** One-Step Equations Word Problems

**** This is a 2-page document! ****

**Directions:** Define a variable and set up an equation, then solve. Give the equation and solution.

**1.** An oven temperature is rising at a rate of 15 degrees each minute. How many minutes will it take the oven to rise 375 degrees?

m = minutes

$\frac{15m}{15} = \frac{375}{15}$

$m = 25$

| Equation | Solution |
|---|---|
| $15m = 375$ | 25 minutes |

**2.** Lake Ontario is 24,360 square miles smaller than the size of Lake Superior. If Lake Ontario is 7,340 square miles, how many square miles is Lake Superior?

S = Lake Superior

$S - 24360 = 7340$

$+24360 \quad +24360$

$S = 31700$

| Equation | Solution |
|---|---|
| $S - 24360 = 7340$ | 31,700 sq. miles |

**3.** Camille went for a 45-minute walk. If she burned an average of 3.2 calories each minute, how many total calories did she burn? X = total calories

$(45)\frac{X}{45} = 3.2 \ (45)$

$X = 144$

| Equation | Solution |
|---|---|
| $\frac{X}{45} = 3.2$ | 144 calories |

**4.** Ramone took the SAT twice. He scored 1340 on his second try, which was 190 points higher than his first score. Find his first score.

F = first score

$F + 190 = 1340$

$-190 \quad -190$

$F = 1150$

| Equation | Solution |
|---|---|
| $F + 190 = 1340$ | 1150 |

**5.** Lyla got a haircut. If she had $2\frac{3}{4}$ cut off and her hair is now $8\frac{7}{10}$ inches long, find the length of her hair before she got it cut.

H = Hair length

$H - 2\frac{3}{4} = 8\frac{7}{10}$

$H - \frac{11}{4} = \frac{87}{10}$

$+\frac{11}{4} \quad +\frac{11}{4}$

$H = \frac{229}{20}$ $\quad H = 11\frac{9}{20}$

| Equation | Solution |
|---|---|
| $H - 2\frac{3}{4} = 8\frac{7}{10}$ | $11\frac{9}{20}$ inches |

**6.** Frank's dog weighs 4.25 times more than his cat weighs. If his cat weighs 13.8 pounds, how much does his dog weigh?

Dog = dog's weight

$(13.8)\frac{D}{13.8} = 4.25 \ (13.8)$

$D = 58.65$

| Equation | Solution |
|---|---|
| $\frac{D}{13.8} = 4.25$ | 58.65 pounds |

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**7.** The toll to cross a bridge is \$1.25. If \$72.50 was collected at a toll booth one hour, how many cars went through the booth?

$C$ = cars

$$\frac{1.25C}{1.25} = \frac{72.50}{1.25}$$

$$C = 58$$

| Equation | Solution |
|---|---|
| $1.25C = 72.50$ | 58 cars |

**8.** Ten years ago, Elijah bought shares of stock at \$1.65 each. The value of the stock is now 1.4 times higher than it was when he purchased it. How much is the stock worth per share now?

$S$ = stock

$$(1.65)\frac{S}{1.65} = 1.4 \cdot (1.65)$$

$$S = 2.31$$

| Equation | Solution |
|---|---|
| $\frac{S}{1.65} = 1.4$ | \$2.31 |

**9.** Vance is buying a new car for \$23,084. If he is trading in his old car for \$9,567 to go towards his new car, how much will he need to pay for his new car?

$X$ = payment

$$X + 9567 = 23084$$
$$-9567 \quad -9567$$
$$X = 13517$$

| Equation | Solution |
|---|---|
| $X + 9567 = 23084$ | \$13,517 |

**10.** Five-eighths of the sixth grade students at Clearview Middle School buy their lunch. If 265 students buy their lunch, how many sixth grade students are there?

$S$ = students

$$\frac{8}{5} \cdot \frac{5}{8} S = 265 \cdot \frac{8}{5}$$

$$S = 424$$

| Equation | Solution |
|---|---|
| $\frac{5}{8} s = 265$ | 424 students |

**11.** Meredith is $\frac{2}{3}$ feet shorter than her friend Tucker. If Meredith is $5\frac{3}{10}$ feet tall, how tall is Tucker?

$T$ = Tucker's height

$$T - \frac{2}{3} = 5\frac{3}{10}$$
$$T - \frac{2}{3} = \frac{53}{10}$$
$$+\frac{2}{3} \quad +\frac{2}{3}$$
$$T = \frac{179}{30} \qquad T = 5\frac{29}{30}$$

| Equation | Solution |
|---|---|
| $T - \frac{2}{3} = 5\frac{3}{10}$ | $5\frac{29}{30}$ ft |

**12.** Treena flew home to visit her family for Thanksgiving and checked two suitcases. If their combined weight was 71.5 pounds and one bag weighed 47.8 pounds, find the weight of the other bag.

$b$ = bag weight

$$b + 47.8 = 71.5$$
$$-47.8 \quad -47.8$$
$$b = 23.7$$

| Equation | Solution |
|---|---|
| $b + 47.8 = 71.5$ | 23.7 lbs |

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Name: _____ **Math 6**

Date: _____ Per: _____ **Unit 3:** Equations & Inequalities

## **Quiz 5-1:** One-Step Equations

**Directions:** Solve each equation. Show your work and check all solutions.

**1.** $\frac{x}{6} = 8$ ·6

$X = 48$

$\frac{48}{6} = 8$

$8 = 8$ ✓

**2.** $w + 13 = 24$

$-13 \quad -13$

$w = 11$

$11 + 13 = 24$

$24 = 24$ ✓

**3.** $\frac{40}{8} = \frac{8r}{8}$

$5 = r$

$40 = 8(5)$

$40 = 40$ ✓

**4.** $c - 8 = 20$

$+8 \quad +8$

$c = 28$

$28 - 8 = 20$

$20 = 20$ ✓

**5.** $14 = a - 3$

$+3 \quad +3$

$17 = a$

$14 = 17 - 3$

$14 = 14$ ✓

**6.** $15 = \frac{p}{3}$ ·3

$45 = p$

$15 = \frac{45}{3}$

$15 = 15$ ✓

**7.** $\frac{3n}{3} = \frac{27}{3}$

$n = 9$

$3(9) = 27$

$27 = 27$ ✓

**8.** $k - 29 = 47$

$+29 \quad +29$

$K = 76$

$76 - 29 = 47$

$47 = 47$ ✓

**9.** (5.2) $\frac{y}{5.2} = 7.125$ (5.2)

$y = 37.05$

$\frac{37.05}{5.2} = 7.125$

$7.125 = 7.125$ ✓

**10.** $16.15 = 4.9 + g$

$-4.9 \quad -4.9$

$11.25 = g$

$16.15 = 4.9 + 11.25$

$16.15 = 16.15$ ✓

1. $x = 48$
2. $w = 11$
3. $r = 5$
4. $c = 28$
5. $a = 17$
6. $p = 45$
7. $n = 9$
8. $K = 76$
9. $y = 37.05$
10. $g = 11.25$

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11. $\frac{5}{2} \cdot \frac{2}{5}z = \frac{8}{15} \cdot \frac{5}{2}$

$z = \frac{4}{3}$

$z = 1\frac{1}{3}$

$\frac{2}{5} \cdot 1\frac{1}{3} = \frac{8}{15}$

$\frac{2}{5} \cdot \frac{4}{3} = \frac{8}{15}$

12. $\frac{11}{15} = x - 2\frac{1}{6}$

$\frac{11}{15} = X - \frac{13}{6}$

$+\frac{13}{6} \quad +\frac{13}{6}$

$\frac{29}{10} = X$ $\quad X = 2\frac{9}{10}$

11. $z = 1\frac{1}{3}$

12. $X = 2\frac{9}{10}$

$\frac{11}{15} = 2\frac{9}{10} - 2\frac{1}{6}$

$\frac{11}{15} = \frac{11}{15}$

**Directions:** Write an equation using a variable to solve each problem, then give the solution.

**13.** Pineview Middle School has 158 fewer students enrolled than Wellington Middle School. If Pineview Middle has 1039 students enrolled, how many students are enrolled at Wellington Middle?

W = Wellington

$W - 158 = 1039$

$+158 \quad +158$

$W = 1197$

| Equation: $W - 158 = 1039$ |
|---|
| Solution: 1197 students |

**14.** A group of six friends went out for dinner and equally split the dinner bill. If they each paid $24.70, what was the dinner bill?

B = bill

$(6) \cdot \frac{B}{6} = 24.70 \cdot (6)$

$B = 148.2$

| Equation: $\frac{B}{6} = 24.70$ |
|---|
| Solution: $148.20 |

**15.** Travis bought a turkey for Thanksgiving. If the turkey costs $1.30 per pound and he paid $18.85, how much did the turkey weigh?

W = Weight

$\frac{18.85}{1.30} = \frac{1.30W}{1.30}$

$14.5 = W$

| Equation: $18.85 = 1.30W$ |
|---|
| Solution: 14.5 lbs |

**16.** Elisa ran a total of $8\frac{4}{5}$ miles on Saturday and Sunday. If she ran $5\frac{1}{4}$ miles on Saturday, how many miles did she run on Sunday?

S = Sunday

$5\frac{1}{4} + S = 8\frac{4}{5}$

$\frac{21}{4} + S = \frac{44}{5}$

$-\frac{21}{4} \quad -\frac{21}{4}$

$S = \frac{71}{20}$ $\quad S = 3\frac{11}{20}$

| Equation: $5\frac{1}{4} + S = 8\frac{4}{5}$ |
|---|
| Solution: $3\frac{11}{20}$ miles |

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| Name: | Date: |
|---|---|
| Topic: | Class: |

| Main Ideas/Questions | Notes/Examples |
|---|---|
| What is an **INEQUALITY?** | A mathematical sentence that compares expressions. |

**Inequality SYMBOLS**

| IS LESS THAN | IS LESS THAN OR EQUAL TO | IS GREATER THAN | IS GREATER THAN OR EQUAL TO |
|---|---|---|---|
| $<$ | $\leq$ | $>$ | $\geq$ |

**WRITING Inequalities**

**Write each sentence as an inequality using a variable.**

| | |
|---|---|
| **1.** "A number is greater than or equal to 5." | $n \geq 5$ |
| **2.** "A number is less than -17." | $n < -17$ |
| **3.** "40 is less than or equal to a number." | $40 \leq n$ |
| **4.** "9 is greater than a number." | $9 > n$ |
| **5.** "A number is fewer than 14." | $n < 14$ |
| **6.** "A number is at least -3." | $n \geq -3$ |
| **7.** "A number is no more than $\frac{1}{2}$." | $n \leq \frac{1}{2}$ |
| **8.** "A number has a minimum value of 9.4." | $n \geq 9.4$ |
| **9.** "A game is designed for ages 13 and up." | $g \geq 13$ |
| **10.** "The theater can seat up to 500 people." | $t \leq 500$ |

**SOLUTIONS to an Inequality**

**A solution to an inequality is a value that makes the inequality true. Determine whether the given value is a solution to the inequality.**

| | |
|---|---|
| **11.** $x > 16$; $x = 20$ <br> $20 > 16$ <br> yes | **12.** $p \leq 5$; $p = 8$ <br> $8 \leq 5$ <br> no |
| **13.** $k < -13$; $k = -4$ <br> $-4 < -13$ <br> no | **14.** $c \geq -10$; $c = -7$ <br> $-7 \geq -10$ <br> yes |
| **15.** $20 \leq a$; $a = 27$ <br> $20 \leq 27$ <br> yes | **16.** $-1 > m$; $m = 2$ <br> $-1 > 2$ <br> no |

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**17.** $n \leq 3.1$; $n = 3.089$

$3.089 \leq 3.1$

yes

**18.** $f > 13.04$; $f = 13.008$

$13.008 > 13.04$

no

**19.** $y > 5.25$; $y = 7.8$

$7.8 > 5.25$

yes

**20.** $60.3 \geq v$; $v = 60.295$

$60.3 \geq 60.295$

yes

**19.** $a \geq \frac{2}{3}$; $a = \frac{7}{10}$

$\frac{7}{10} \geq \frac{2}{3}$

yes

**22.** $n < 1\frac{2}{5}$; $n = 1\frac{4}{9}$

$1\frac{4}{9} < 1\frac{2}{5}$

no

**23.** $\frac{1}{4} > q$; $q = \frac{3}{20}$

$\frac{1}{4} > \frac{3}{20}$

yes

**20.** $z \leq \frac{3}{8}$; $z = \frac{1}{2}$

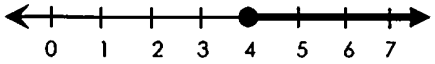
$\frac{1}{2} \leq \frac{3}{8}$

no

## GRAPHING *Inequalities*

**The set of all solutions of an inequality is called the solution set.**
We can graph the solution set of an inequality using a number line with an arrow pointing towards all possible solutions.

**Example:** $x \geq 4$ means "$x$ is a number that is greater than or equal to 4."



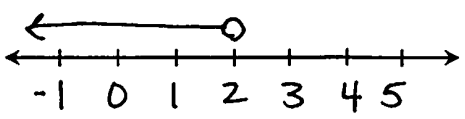

**When graphing inequalities:**

- Use an open circle for $<$ or $>$ symbols.
- Use a closed circle for $\leq$ or $\geq$ symbols.

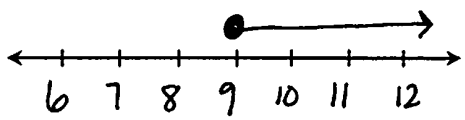
## EXAMPLES

**Directions:** Graph each inequality on the number line.

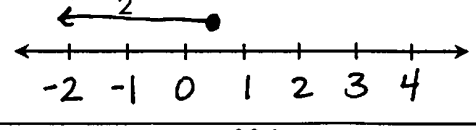
**25.** $k < 2$



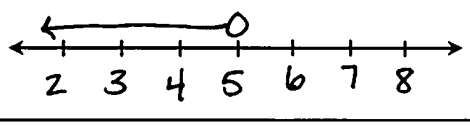

**26.** $a \geq 9$



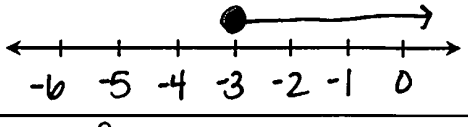

**27.** $p \leq \frac{1}{2}$



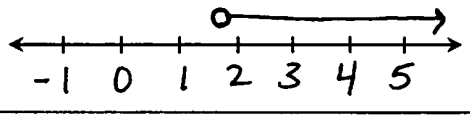

**28.** $5 > x$ $x < 5$



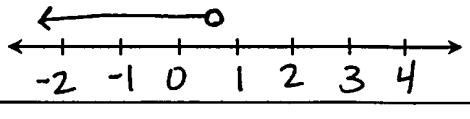

**29.** $-3 \leq m$ $m \geq -3$



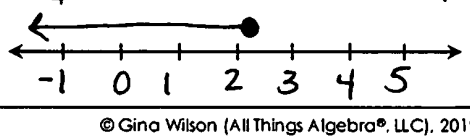

**30.** $y > 1.7$




**31.** $z < \frac{2}{3}$




**32.** $\frac{9}{4} \geq x$ $x \leq \frac{9}{4}$ $x \leq 2\frac{1}{4}$

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Name: _____ **Unit 5:** Equations & Inequalities

Date: _____ Per: _____ **Homework 6:** Writing & Graphing Inequalities

**Write each sentence as an inequality.**

1. "A number is less than 3." $n < 3$
2. "16 is greater than or equal to a number." $16 \geq n$
3. "A number is greater than $\frac{3}{8}$." $n > \frac{3}{8}$
4. "A number is at most -4." $n \leq -4$
5. "A number is no less than -11." $n \geq -11$
6. "$75 is larger than all bids." $75 > b$
7. "A bus can hold a maximum of 60 students." $b \leq 60$
8. "Roller coaster riders must be at least 48 inches tall." $r \geq 48$

**Describe a situation that can be represented by an inequality. Then write the inequality.**

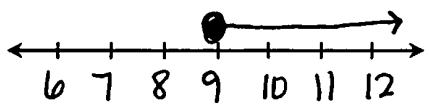
9. To earn extra credit, the students must answer at least 6 bonus questions. **Inequality:** $e \geq 6$
10. Gerry must drive within the 55 mph speed limit. **Inequality:** $G \leq 55$

**Determine whether the given value is a solution to the inequality.**

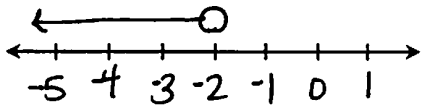
11. $x < 15$; $x = 28$ — $28 < 15$ no
12. $n \geq -4$; $n = -1$ — $-1 \geq -4$ yes
13. $w \leq -23$; $w = -27$ — $-27 \leq -23$ yes
14. $a > -6$; $a = -8$ — $-8 > -6$ no
15. $r \leq 1\frac{2}{3}$; $r = 1\frac{5}{9}$ — $1\frac{5}{9} \leq 1\frac{2}{3}$ yes
16. $y > \frac{5}{6}$; $y = \frac{5}{6}$ — $\frac{5}{6} > \frac{5}{6}$ no
17. $c \geq 6.05$; $c = 6.0389$ — $6.0389 \geq 6.05$ no
18. $k < \frac{3}{5}$; $k = \frac{11}{20}$ — $\frac{11}{20} < \frac{3}{5}$ yes
19. $p > 20.095$; $p = 20.603$ — $20.603 > 20.095$ yes

**Graph each inequality on the number line.**

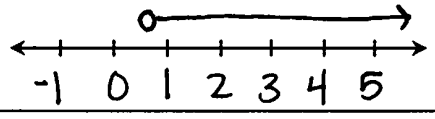
20. $x \geq 9$



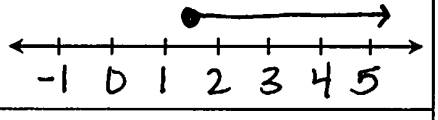

21. $m < -2$



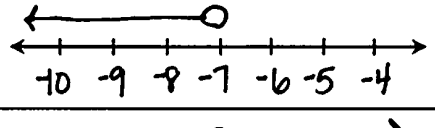

22. $z > \frac{3}{4}$



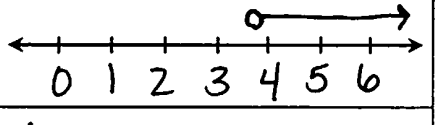

23. $1.5 \leq p$ $p \geq 1.5$



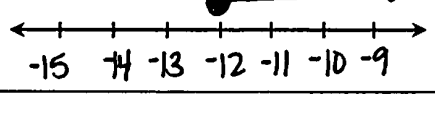

24. $-7 > a$ $a < -7$



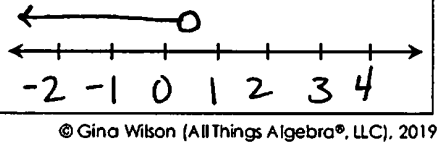

25. $z > 3.8$




26. $c \geq -12$




27. $\frac{1}{2} > k$ $k < \frac{1}{2}$

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| Name: | Date: |
|---|---|
| Topic: | Class: |

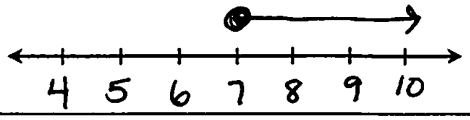
| Main Ideas/Questions | Notes/Examples |
|---|---|
| **SOLVING INEQUALITIES** with addition & subtraction | • **Addition Property of Inequality:** If you add the same number to both sides of an inequality, the inequality remains true.<br>• **Subtraction Property of Inequality:** If you subtract the same number from both sides of an inequality, the inequality remains true. |

**Solve the inequality and graph the solution.**

**1.** $x - 5 \geq 2$

$+5 \quad +5$

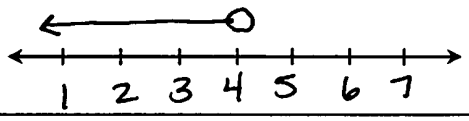
$\boxed{x \geq 7}$




**2.** $k + 9 < 13$

$-9 \quad -9$

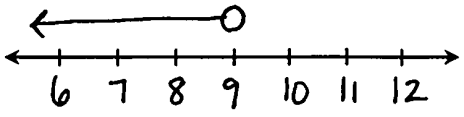
$\boxed{k < 4}$




**3.** $16 > p + 7$

$-7 \quad -7$

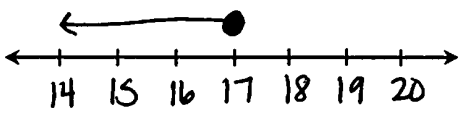
$9 > p$ ; $\boxed{p < 9}$




**4.** $y - 9 \leq 8$

$+9 \quad +9$

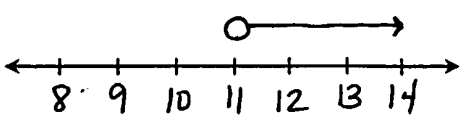
$\boxed{y \leq 17}$




**5.** $a + 13 > 24$

$-13 \quad -13$

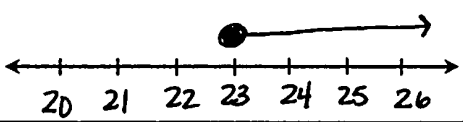
$\boxed{a > 11}$




**6.** $9 \leq r - 14$

$+14 \quad +14$

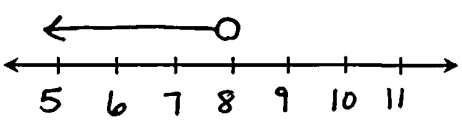
$23 \leq r$ ; $\boxed{r \geq 23}$




**7.** $14 > 6 + n$

$-6 \quad -6$

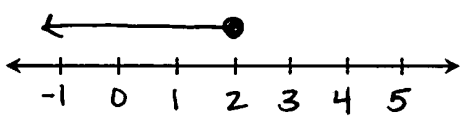
$8 > n$ ; $\boxed{n < 8}$




**8.** $c - 1 \leq 1$

$+1 \quad +1$

$\boxed{c \leq 2}$

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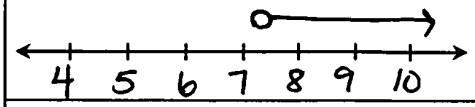
**9.** $1.4 < g - 5.8$

$+5.8 \quad +5.8$

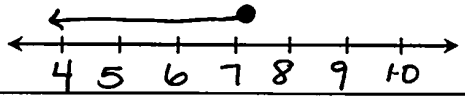
$7.2 < g$ → $g > 7.2$




**10.** $m + 3.7 \leq 10.85$

$-3.7 \quad -3.7$

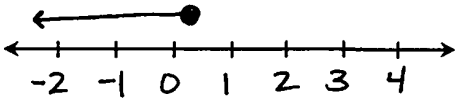
$m \leq 7.15$




**11.** $h - \frac{2}{3} \leq \frac{4}{5}$

$+\frac{2}{3} \quad +\frac{2}{3}$

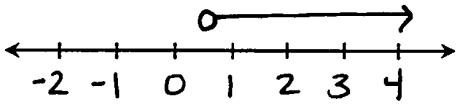
$h \leq \frac{22}{15}$




**12.** $1\frac{7}{8} < 1\frac{1}{4} + s$

$-1\frac{1}{4} \quad -1\frac{1}{4}$

$\frac{5}{8} < s$ → $s > \frac{5}{8}$




## IDENTIFYING solutions

**Determine whether the given value is a solution to the inequality.**

**13.** $x + 16 \leq 23$; $x = 9$

$9 + 16 \leq 23$

$25 \leq 23$

no

**14.** $m - 2 > 7$; $m = 10$

$10 - 2 > 7$

$8 > 7$

yes

**15.** $32 > 15 + k$; $k = 19$

$32 > 15 + 19$

$32 > 34$

no

**16.** $\frac{3}{4} \geq \frac{1}{2} + y$; $y = \frac{3}{10}$

$\frac{3}{4} \geq \frac{1}{2} + \frac{3}{10}$

$\frac{3}{4} \geq \frac{4}{5}$

no

**17.** $n + 7 \leq 14$; $n = 9$

$9 + 7 \leq 14$

$16 \leq 14$

no

**18.** $5 < p - 16$; $p = 21$

$5 < 21 - 6$

$5 < 5$

no

**19.** $12.4 > r - 3.9$; $r = 16.25$

$12.4 > 16.25 - 3.9$

$12.4 > 12.35$

yes

**20.** $z + 3.7 \geq 10.1$; $z = 6.4$

$6.4 + 3.7 \geq 10.1$

$10.1 \geq 10.1$

yes

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**Name:** _____ **Unit 5:** Equations & Inequalities

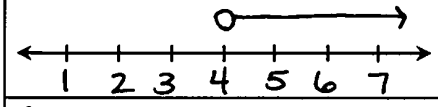
**Date:** _____ **Per:** _____ **Homework 7:** Solving One-Step Inequalities (using addition/subtraction)

**Directions:** Solve the inequality and graph the solution.

**1.** $x-3>1$

$+3\ +3$

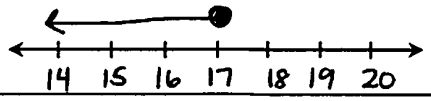
$x>4$




**2.** $p+2\le 19$

$-2\ -2$

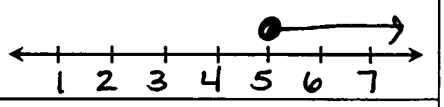
$p\le 17$




**3.** $9\le k+4$

$-4\ -4$

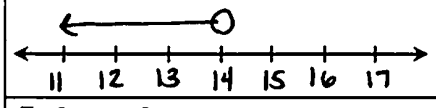
$5\le k$ $\quad k\ge 5$




**4.** $v-2<12$

$+2\ +2$

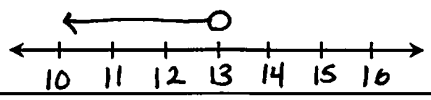
$v<14$




**5.** $21>8+j$

$-8\ -8$

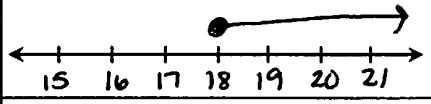
$13>j$ $\quad j<13$




**6.** $z-3\ge 15$

$+3\ +3$

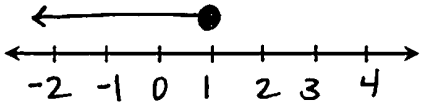
$z\ge 18$




**7.** $9\ge a+8$

$-8\ -8$

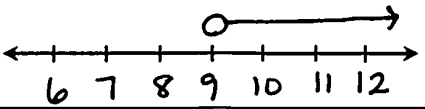
$1\ge a$ $\quad a\le 1$




**8.** $c-2>7$

$+2\ +2$

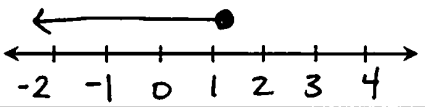
$c>9$




**9.** $h-0.35\le 0.9$

$+0.35\ +0.35$

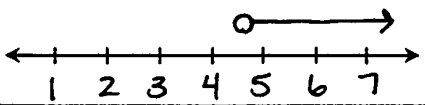
$h\le 1.25$




**10.** $8.5<m+3.9$

$-3.9\ -3.9$

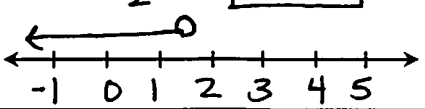
$4.6<m$ $\quad m>4.6$




**11.** $r-\frac{9}{10}<\frac{3}{5}$

$+\frac{9}{10}\ +\frac{9}{10}$

$r<\frac{3}{2}$ $\quad r<1\frac{1}{2}$

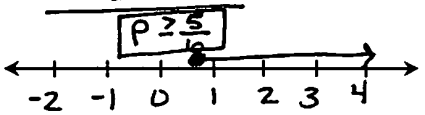



**12.** $p+3\frac{1}{2}\ge 4\frac{1}{3}$

$p+\frac{7}{2}\ge\frac{13}{3}$

$-\frac{7}{2}\ -\frac{7}{2}$

$p\ge\frac{5}{6}$




**Directions:** Determine if the given value is a solution to the inequality.

**13.** $a+3\le 8;\ a=4$

$4+3\le 8$

$7\le 8$ Yes

**14.** $10\ge 3+m;\ m=9$

$10\ge 3+9$

$10\ge 12$ no

**15.** $k-11>4;\ k=16$

$16-11>4$

$5>4$ Yes

**16.** $p-2>6;\ p=8$

$8-2>6$

$6>6$ no

**17.** $1.4\le y-0.2;\ y=1.5$

$1.4\le 1.5-0.2$

$1.4\le 1.3$ no

**18.** $c+\frac{1}{3}<\frac{6}{5};\ c=\frac{3}{4}$

$\frac{3}{4}+\frac{1}{3}<\frac{6}{5}$

$\frac{13}{12}<\frac{6}{5}$ Yes

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| Name: | Date: |
|---|---|
| Topic: | Class: |

| Main Ideas/Questions | Notes/Examples |
|---|---|

# SOLVING INEQUALITIES

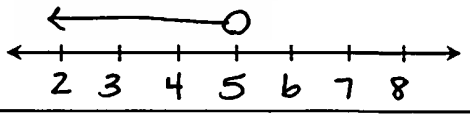
*with Multiplication & Division*

- **Multiplication Property of Inequality:** If you multiply both sides of an inequality by the same positive number, the inequality remains true.
- **Division Property of Inequality:** If you divide both sides of an inequality by the same positive number, the inequality remains true.

**Solve the inequality and graph the solution.**

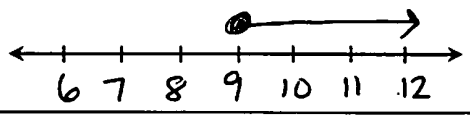
**1.** $\frac{2x}{2} < \frac{10}{2}$

$x < 5$



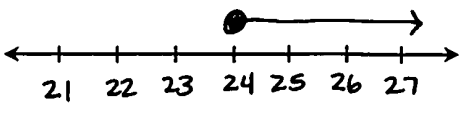

**2.** $\frac{7a}{7} \geq \frac{63}{7}$

$a \geq 9$



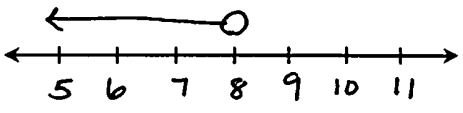

**3.** $\frac{m}{3} \geq 8 \cdot 3$

$m \geq 24$



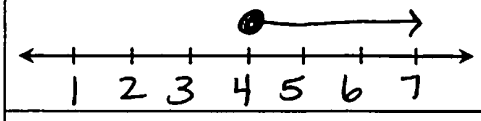

**4.** $2 > \frac{k}{4} \cdot 4$

$8 > K \quad K < 8$



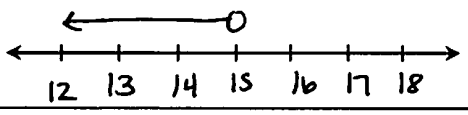

**5.** $\frac{7x}{7} \geq \frac{28}{7}$

$x \geq 4$



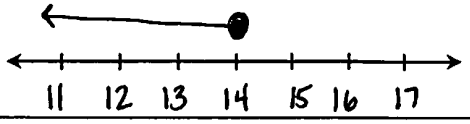

**6.** $\frac{p}{5} < 3 \cdot 5$

$p < 15$



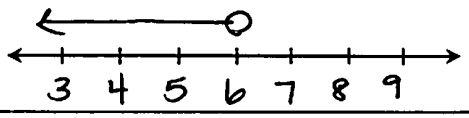

**7.** $\frac{c}{2} \leq 7 \cdot 2$

$c \leq 14$




**8.** $\frac{18}{3} > \frac{3n}{3}$

$6 > n \quad n < 6$

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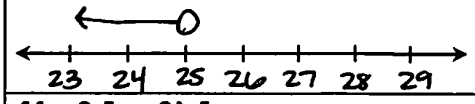
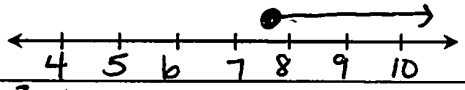
**9.** $\frac{0.8a}{0.8} < \frac{20}{0.8}$

$a < 25$



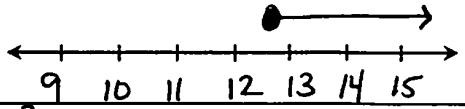

**10.** $4.75 \le \frac{k}{1.6} \cdot 1.6$

$7.6 \le K$ $\quad K \ge 7.6$



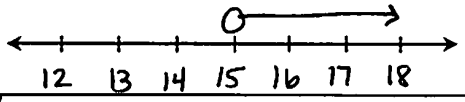

**11.** $\frac{2.5v}{2.5} \ge \frac{31.5}{2.5}$

$V \ge 12.6$




**12.** $\frac{4}{3}p > 20 \cdot \frac{3}{4}$

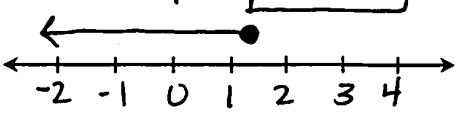
$p > 15$




**13.** $m \div \frac{2}{5} \le 3\frac{1}{8} \cdot \frac{2}{5}$

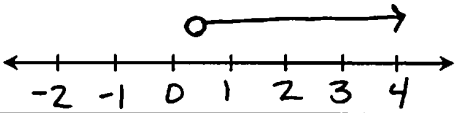
$m \le \frac{25}{8} \cdot \frac{2}{5}$

$m \le \frac{5}{4}$ $\quad m \le 1\frac{1}{4}$




**14.** $\frac{3}{8} < \frac{5}{6}k \cdot \frac{6}{5}$

$\frac{9}{20} < K$ $\quad K > \frac{9}{20}$




## IDENTIFYING solutions

**Determine whether the given value is a solution to the inequality.**

**15.** $4m \le 16;\ m = 3$

$4(3) \le 16$

$12 \le 16$

yes

**16.** $24 < 2c;\ c = 12$

$24 < 2(12)$

$24 < 24$

no

**17.** $\frac{y}{3} > 5;\ y = 21$

$\frac{21}{3} > 5$

$7 > 5$

yes

**18.** $\frac{z}{8} \ge 3;\ z = 16$

$\frac{16}{8} \ge 3$

$2 \ge 3$

no

**19.** $16 > 8m;\ m = 4$

$16 > 8(4)$

$16 > 32$

no

**20.** $2 \ge \frac{r}{9};\ r = 18$

$2 \ge \frac{18}{9}$

$2 \ge 2$

yes

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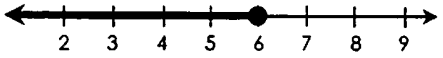
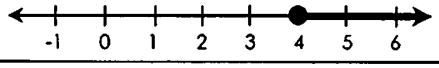
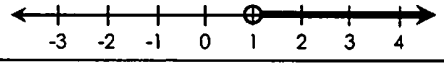
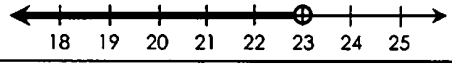
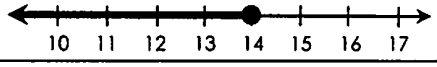
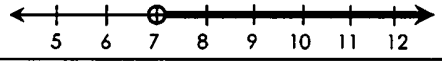
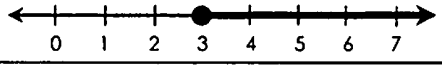
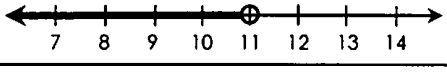
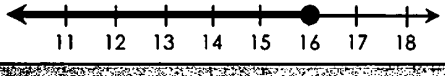
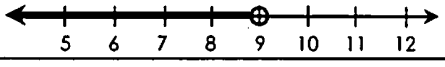
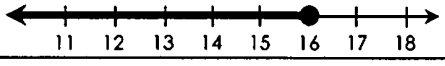
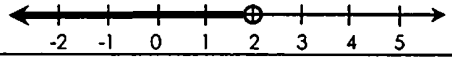
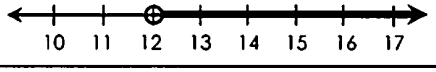
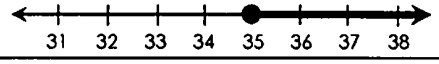
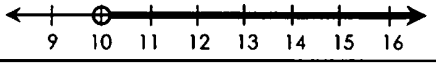
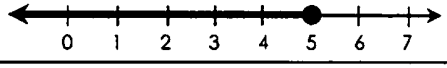
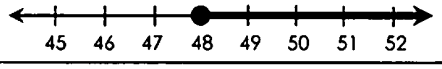
# WHAT SHOULD A CLOCK DO when it's still hungry?

**Directions:** Solve each inequality. Show all work on a separate sheet of paper. Match the solution to the inequality with its corresponding graph within each set. One will have a letter and the other a number. Write the letter in the matching numbered box at the bottom of the page.

| | | | | |
|---|---|---|---|---|
| **SET 1 (addition/subtraction)** | | | | |
| **6.** | $x+3>10$ | $x>7$ | **S.** |   |
| **12.** | $x-11\leq 5$ | $x\leq 16$ | **C.** |   |
| **1.** | $15\leq x+12$ | $3\leq x$ | **N.** |   |
| **16.** | $x-6<5$ | $x<11$ | **O.** |   |
| **5.** | $x+6\geq 10$ | $x\geq 4$ | **B.** |   |
| **11.** | $13\geq 7+x$ | $6\geq x$ | **K.** |   |
| **8.** | $x-9<14$ | $x<23$ | **G.** |   |
| **15.** | $14<x+13$ | $1<x$ | **D.** |   |
| **3.** | $x-6\leq 8$ | $x\leq 14$ | **E.** |   |
| **SET 2 (multiplication/division)** | | | | |
| **14.** | $6x\leq 30$ | $x\leq 5$ | **C.** |   |
| **9.** | $\frac{x}{3}>4$ | $x>12$ | **F.** |   |
| **2.** | $\frac{x}{5}\geq 7$ | $x\geq 35$ | **A.** |   |
| **13.** | $2x<18$ | $x<9$ | **U.** |   |
| **7.** | $4\geq \frac{x}{4}$ | $16\geq x$ | **O.** |   |
| **17.** | $5x>50$ | $x>10$ | **S.** |   |
| **10.** | $\frac{x}{6}\geq 8$ | $x\geq 48$ | **O.** |   |
| **4.** | $24>12x$ | $2>x$ | **R.** |   |

## ANSWER:

| 1. | 2. | | 3. | 4. | 5. | 6. | | 7. | 8. | 9. | 10. | | 11. | 12. | 13. | 14. | 15. | 16. | 17. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| G | O | | B | A | C | K | | F | O | U | R | | S | E | C | O | N | D | S | ! |

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**Name:** _____ **Unit 5:** Equations & Inequalities

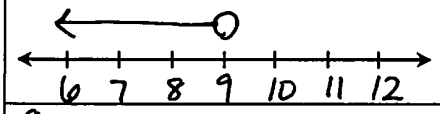
**Date:** _____ **Per:** _____ **Homework 8:** Solving One-Step Inequalities (using multiplication/division)

**Directions:** Solve the inequality and graph the solution.

**1.** $4x < 36$

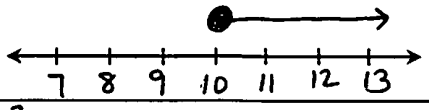
$\frac{4x}{4} < \frac{36}{4}$

$x < 9$




**2.** $\frac{k}{5} \geq 2$ ·5

$k \geq 10$

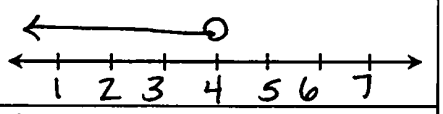



**3.** $28 > 7m$

$\frac{28}{7} > \frac{7m}{7}$

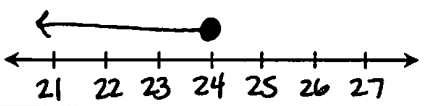
$4 > m$

$m < 4$




**4.** $\frac{c}{8} \leq 3$ ·8

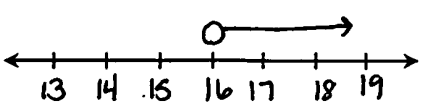
$c \leq 24$




**5.** $8 < \frac{r}{2}$ ·2

$16 < r$

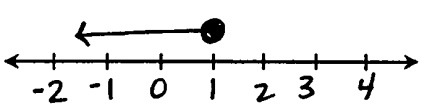
$r > 16$




**6.** $10f \leq 10$

$\frac{10f}{10} \leq \frac{10}{10}$

$f \leq 1$

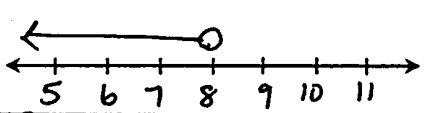



**7.** $72 > 9y$

$\frac{72}{9} > \frac{9y}{9}$

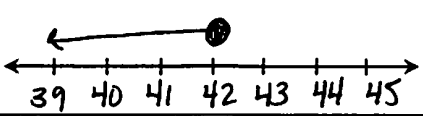
$8 > y$

$y < 8$




**8.** $\frac{a}{6} \leq 7$ ·6

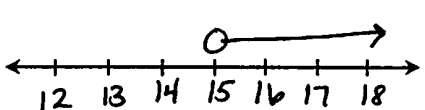
$a \leq 42$




**9.** $4v > 60$

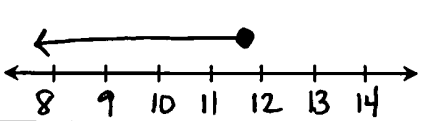
$\frac{4v}{4} > \frac{60}{4}$

$v > 15$




**10.** $\frac{z}{1.5} \leq 7.8$ · 1.5

$z \leq 11.7$

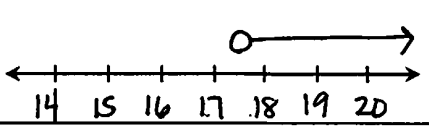



**11.** $14 < 0.8m$

$\frac{14}{0.8} < \frac{0.8m}{0.8}$

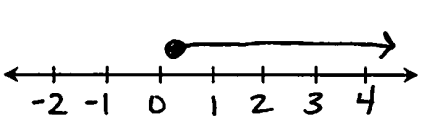
$17.5 < m$

$m > 17.5$




**12.** $\frac{10}{3}p \geq \frac{8}{9}$ · $\frac{3}{10}$

$p \geq \frac{4}{15}$




**Directions:** Determine if the given value is a solution to the inequality.

**13.** $9x \leq 36$; $x = 2$

$9(2) \leq 36$

$18 \leq 36$

yes

**14.** $\frac{k}{4} < 5$; $k = 28$

$\frac{28}{4} < 5$

$7 < 5$

no

**15.** $6 < \frac{v}{6}$; $v = 18$

$6 < \frac{18}{6}$

$6 < 3$

no

**16.** $0.5n \geq 6$; $n = 12$

$0.5(12) \geq 6$

$6 \geq 6$

yes

**17.** $\frac{z}{8} \geq 7$; $z = 32$

$\frac{32}{8} \geq 7$

$4 \geq 7$

no

**18.** $3p > 21$; $p = 7$

$3(7) > 21$

$21 > 21$

no

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| Name: | Date: |
|---|---|
| Topic: | Class: |

| Main Ideas/Questions | Notes/Examples |
|---|---|

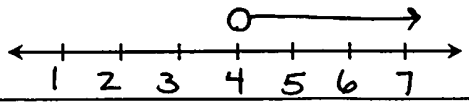
# MIXED
## One-Step
# INEQUALITIES

**Solve and graph the solution to each inequality.**

**1.** $c - 3 > 1$

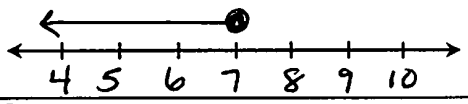
$+3 \quad +3$

$c > 4$




**2.** $\frac{2m}{2} \leq \frac{14}{2}$

$m \leq 7$

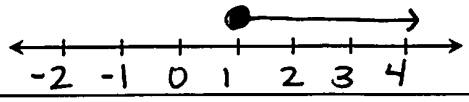



**3.** $10 \leq a + 9$

$-9 \quad -9$

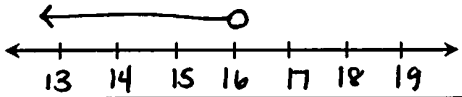
$1 \leq a$

$a \geq 1$



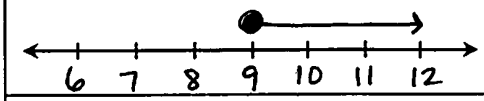

**4.** $\frac{y}{8} < 2 \cdot 8$

$y < 16$




**5.** $\frac{5r}{5} \geq \frac{45}{5}$

$r \geq 9$

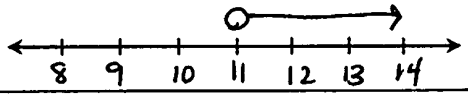



**6.** $3 < k - 8$

$+8 \quad +8$

$11 < K$

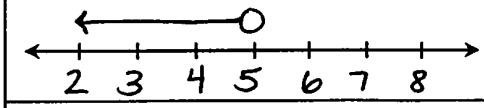
$K > 11$




**7.** $x + 14 < 19$

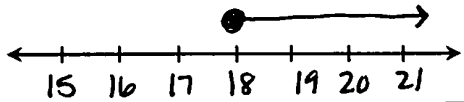
$-14 \quad -14$

$x < 5$




**8.** $\frac{p}{3} \geq 6 \cdot 3$

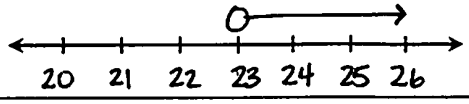
$p \geq 18$




**9.** $n - 17 > 6$

$+17 \quad +17$

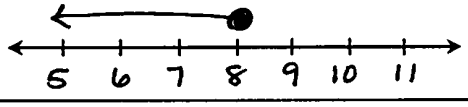
$n > 23$




**10.** $\frac{40}{5} \geq \frac{5g}{5}$

$8 \geq g$

$g \leq 8$

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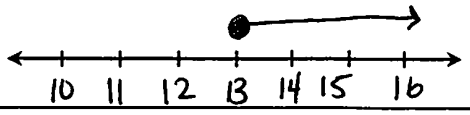
**11.** $w + 2 \geq 15$

$-2 \quad -2$

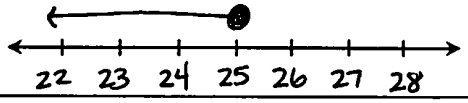
$w \geq 13$




**12.** $12 \geq v - 13$

$+13 \quad +13$

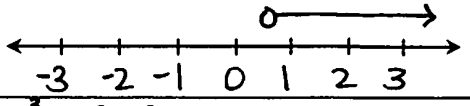
$25 \geq v \qquad v \leq 25$




**13.** $4k > 2.4$

$\frac{}{4} \quad \frac{}{4}$

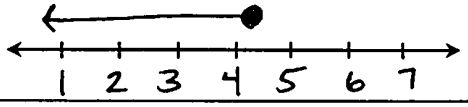
$k > 0.6$




**14.** $z + 7.8 \leq 12.1$

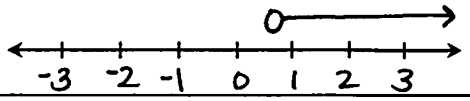
$-7.8 \quad -7.8$

$z \leq 4.3$




**15.** $x \div \frac{3}{4} > \frac{8}{9} \cdot \frac{3}{4}$

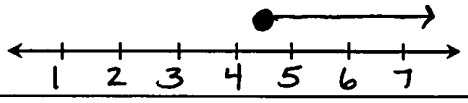
$x > \frac{2}{3}$




**16.** $3\frac{2}{3} \leq c - \frac{5}{6}$

$\frac{11}{3} \leq c - \frac{5}{6}$

$\frac{9}{2} \leq c \qquad c \geq 4\frac{1}{2}$




# TRANSLATING One-Step INEQUALITIES

**Translate each inequality using a variable.**

| | |
|---|---|
| **17.** "The sum of a number and 3 is less than or equal to 8." | $n + 3 \leq 8$ |
| **18.** "The product of a number and 5 is greater than 20." | $5n > 20$ |
| **19.** "7 subtracted from a number is no less than 16." | $n - 7 \geq 16$ |
| **20.** "10 is fewer than the quotient of a number and 4" | $10 < \frac{n}{4}$ |
| **21.** "Three-fourths of a number is at least 75." | $\frac{3}{4}n \geq 75$ |
| **22.** "A number increased by 8 is greater than 20" | $n + 8 > 20$ |
| **23.** "A number divided by 5 has a minimum value of 9." | $\frac{n}{5} \geq 9$ |
| **24.** "Fifteen is less than 4 subtracted from a number." | $15 < n - 4$ |

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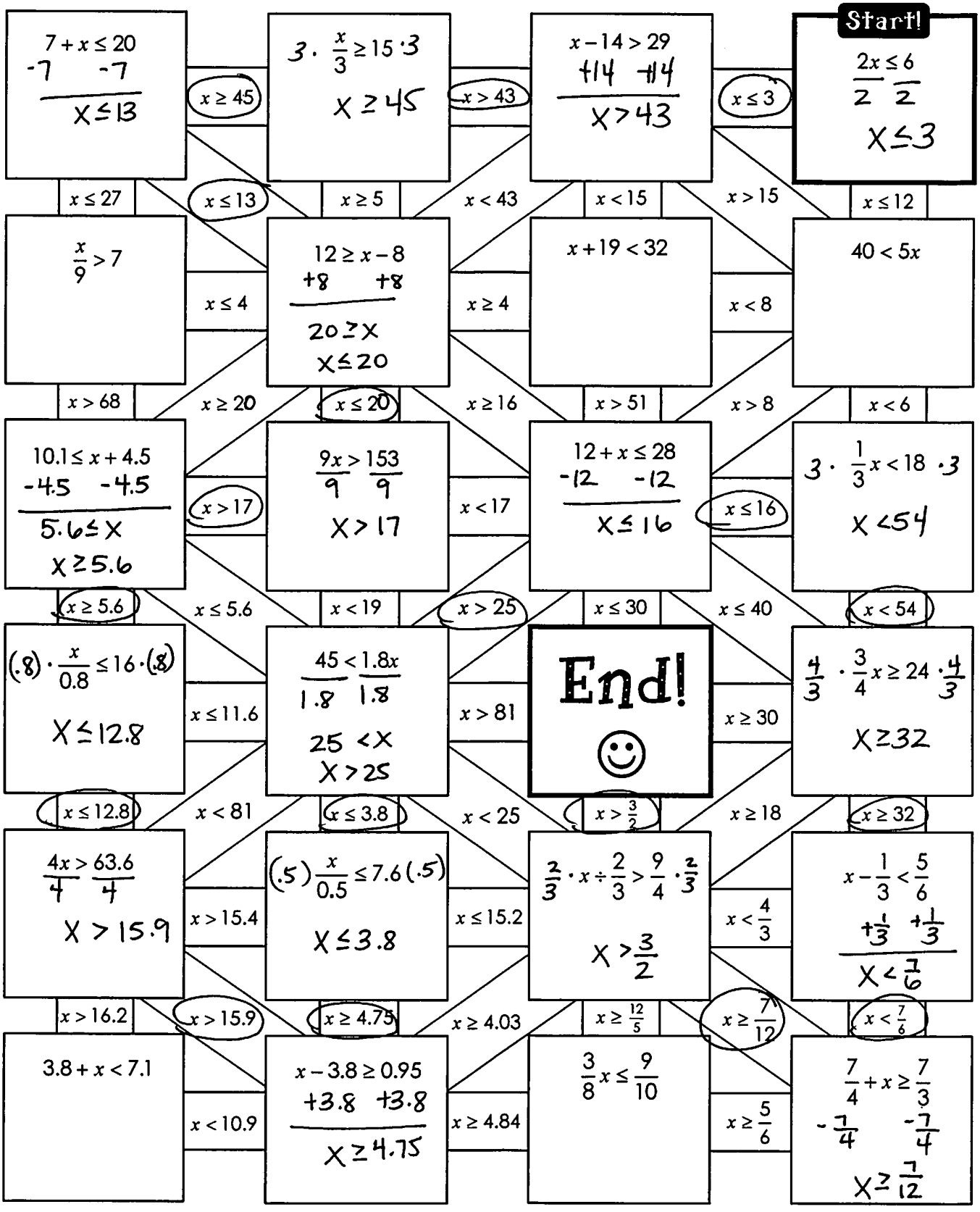
# ONE-STEP INEQUALITIES MAZE!

**Directions:** Solve each inequality. Use your solutions to navigate through the maze. **Show all work!**

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**Name:** _____ **Unit 5:** Equations & Inequalities

**Date:** _____ **Per:** _____ **Homework 9:** Solving One-Step Inequalities (all operations)

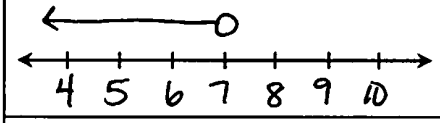
**** This is a 2-page document! ****

**Directions:** Solve and graph the solution to each inequality.

**1.** $x+8<15$

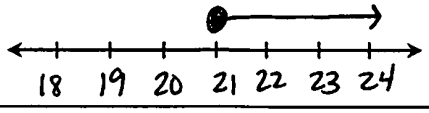
$-8\ -8$

$x<7$




**2.** $\frac{p}{3}\geq 7$ ·3

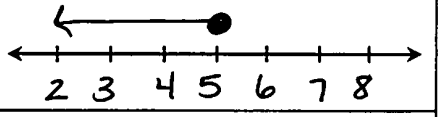
$p\geq 21$




**3.** $4a\leq 20$

$\frac{4a}{4}\leq\frac{20}{4}$

$a\leq 5$

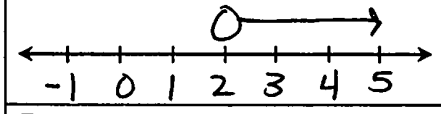



**4.** $1<v-1$

$+1\ +1$

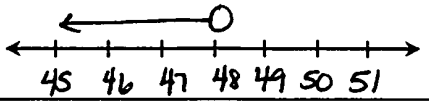
$2<v$

$v>2$




**5.** $\frac{r}{8}<6$ ·8

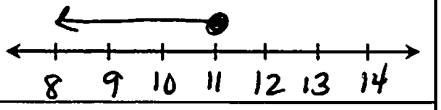
$r<48$




**6.** $k+3\leq 14$

$-3\ -3$

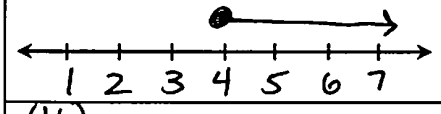
$k\leq 11$




**7.** $8c\geq 32$

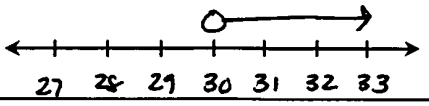
$\frac{8c}{8}\geq\frac{32}{8}$

$c\geq 4$




**8.** $\frac{w}{5}>6$ ·5

$w>30$

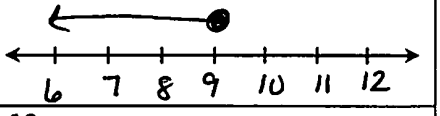



**9.** $5\geq n-4$

$+4\ +4$

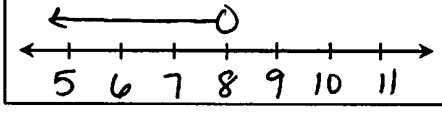
$9\geq n$

$n\leq 9$




**10.** $\frac{y}{1.6}<5$ (1.6)

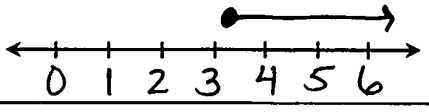
$y<8$




**11.** $g+8.9\geq 12.1$

$-8.9\ -8.9$

$g\geq 3.2$

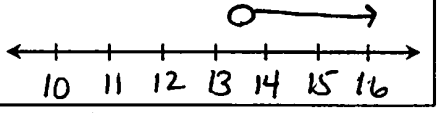



**12.** $16.2<1.2t$

$\frac{16.2}{1.2}<\frac{1.2t}{1.2}$

$13.5<t$

$t>13.5$

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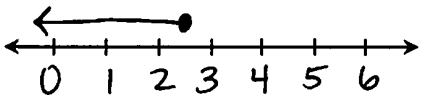
**13.** $x - \frac{3}{5} \leq 1\frac{9}{10}$

$x - \frac{3}{5} \leq \frac{19}{10}$

$+\frac{3}{5} \quad +\frac{3}{5}$

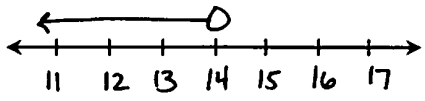
$x \leq \frac{5}{2}$ $\quad x \leq 2\frac{1}{2}$




**14.** $\frac{7}{3} > \frac{1}{6}f \cdot 6$

$14 < f$

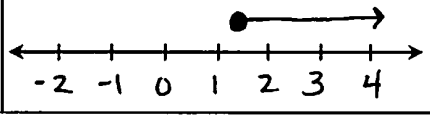
$f < 14$




**15.** $r \div \frac{5}{8} \geq 2\frac{2}{15}$

$\frac{5}{8} \cdot r \div \frac{5}{8} \geq \frac{32}{15} \cdot \frac{5}{8}$

$r \geq \frac{4}{3}$ $\quad r \geq 1\frac{1}{3}$




**Directions:** Determine whether the given value is a solution to the inequality.

**16.** $c - 5 > 8$; $c = 16$

$16 - 5 > 8$

$11 > 8$

Yes

**17.** $4 \geq \frac{m}{6}$; $m = 30$

$4 \geq \frac{30}{6}$

$4 \geq 5$

no

**18.** $7v \geq 49$; $v = 8$

$7(8) \geq 49$

$56 \geq 49$

Yes

**19.** $13 > k + 9$; $k = 4$

$13 > 4 + 9$

$13 > 13$

no

**20.** $3a > 42$; $a = 13$

$3(13) > 42$

$39 > 42$

no

**21.** $\frac{p}{4} \leq 5$; $p = 20$

$\frac{20}{4} \leq 5$

$5 \leq 5$

Yes

**22.** $r - 0.9 \geq 12.38$; $r = 13.1$

$13.1 - 0.9 \geq 12.38$

$12.2 \geq 12.38$

no

**23.** $4g < 21.2$; $g = 5.2$

$4(5.2) < 21.2$

$20.8 < 21.2$

Yes

**24.** $\frac{7}{8} < y - \frac{1}{2}$; $y = 1\frac{3}{10}$

$\frac{7}{8} < \frac{13}{10} - \frac{1}{2}$

$\frac{7}{10} < \frac{4}{5}$

Yes

**Directions:** Translate each inequality. Do not solve.

| | |
|---|---|
| **25.** "The difference between a number and 7 is greater than 16." | $n - 7 > 16$ |
| **26.** "Twice a number is less than 30." | $2n < 30$ |
| **27.** "5 more than a number is greater than or equal to 27." | $n + 5 \geq 27$ |
| **28.** "The quotient of a number and 6 is at most 8." | $\frac{n}{6} \leq 8$ |
| **29.** "14 subtracted from a number is no less than 50." | $n - 14 \geq 50$ |
| **30.** "42 is fewer than the product of a number and 3." | $42 < 3n$ |
| **31.** "Two-fifths of a number has a maximum value of 75." | $\frac{2}{5}n \leq 75$ |
| **32.** "20 less than a number is at least 100." | $n - 20 \geq 100$ |

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| Name: | Date: |
|---|---|
| Topic: | Class: |

| Main Ideas/Questions | Notes/Examples |
|---|---|

# REAL-WORLD
One-Step Inequalities

**Use the steps below to guide you in writing inequalities to solve problems.**

| ❶ CHOOSE A VARIABLE | ❷ WRITE AN EQUATION | ❸ SOLVE! |
|---|---|---|
| What are you trying to find? Assign this to a variable if the problem doesn't give it. | Look for key words for the operation and direction of the inequality! | Be sure to check your answer! |

## SET 1:
Addition & Subtraction

**Directions:** Define a variable, write an inequality, and give the solution.

**1.** A marathon runner plans to run at least 62 miles this week. So far, he has run 27 miles. How many more miles does he need to run to reach his goal?

$$27+m \geq 62$$
$$-27 \quad -27$$
$$m \geq 35$$

**Variable:** $m$ = miles

**Inequality:** $27+m \geq 62$

**Solution:** $m \geq 35$ miles

**2.** Aria likes to keep her credit card balance below $800. Her last statement showed a balance over this amount, so she sent in a payment for $250 to bring the balance under her limit. What was the balance on her statement?

$$b-250 < 800$$
$$+250 \quad +250$$
$$b < 1050$$

**Variable:** $b$ = balance

**Inequality:** $b-250 < 800$

**Solution:** $b < \$1050$

**3.** A category 4 storm in the Atlantic ocean has a wind speed of 132 mph. The wind speed must reach a minimum of 157 mph to be classified as a category 5 storm. Find the change in wind speed required to change the storm to category 5.

$$157 \leq x + 132$$
$$-132 \quad -132$$
$$25 \leq x$$

**Variable:** $x$ = change in wind

**Inequality:** $157 \leq x+132$

**Solution:** $x \geq 25$

## SET 2:
Multiplication & Division

**4.** Students on a field trip are divided into 24 groups with no more than 5 students in each group. Find the number of students on the field trip.

$$24 \cdot \frac{s}{24} \leq 5 \cdot 24$$
$$s \leq 120$$

**Variable:** $s$ = students

**Inequality:** $\frac{s}{24} \leq 5$

**Solution:** $s \leq 120$ students

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**5.** A stock is selling at $2.40 per share. If Gary can spend at most $150 on the stock, how many shares can he purchase?

$\frac{2.40x}{2.40} \leq \frac{150}{2.40}$

$x \leq 62.5$

**Variable:** $x = \#$ shares

**Inequality:** $2.40x \leq 150$

**Solution:** $x \leq 62.5$ shares

**6.** An online shop had at least 3 times as many orders in 2019 than they had in 2018. If they had 225 orders in 2018, how many orders did they have in 2019?

$225 \cdot \frac{x}{225} \geq 3 \cdot 225$

$x \geq 675$

**Variable:** $x =$ orders

**Inequality:** $\frac{x}{225} \geq 3$

**Solution:** $x \geq 675$ orders

## SET 3:
Mixed Operations

2ft = 24 in →

**7.** Kate withdrew $240 from her bank account, leaving a balance that is greater than $500. What was her balance before the withdrawal?

$b - 240 > 500$

$+240 \quad +240$

$b > 740$

**Variable:** $b =$ balance

**Inequality:** $b - 240 > 500$

**Solution:** $b > \$740$

**8.** Jeremiah ran 6 miles. His average pace per mile was no more than 8 minutes. How many minutes did Jeremiah spend running?

$6 \cdot \frac{M}{6} \leq 8 \cdot 6$

$M \leq 48$

**Variable:** $M =$ Minutes

**Inequality:** $\frac{M}{6} \leq 8$

**Solution:** $m \leq 48$ min

**9.** A lake is rising at a rate of 1.5 inches per day. If the lake rises more than 2 feet, it will cause flooding. How many days can the lake rise at this rate without causing flooding?

$\frac{1.5d}{1.5} \leq \frac{24}{1.5}$

$d \leq 16$

**Variable:** $d =$ days

**Inequality:** $1.5d \leq 24$

**Solution:** $d \leq 16$ days

**10.** A theater must sell a minimum of 1,200 tickets for a show to go on. If they have sold 387 tickets so far, how many more tickets must they sell?

$t + 387 \geq 1200$

$-387 \quad -387$

$t \geq 813$

**Variable:** $t =$ tickets

**Inequality:** $t + 387 \geq 1200$

**Solution:** $t \geq 813$ tickets

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Name: _____ **Unit 5:** Equations & Inequalities

Date: _____ Per: _____ **Homework 10:** One-Step Inequalities Word Problems

**** This is a 2-page document! ****

**Directions:** Solve each problem using an inequality. Identify both the inequality and solution.

**1.** A gym teacher placed golf balls into 9 buckets so that each bucket had at least 15 balls. How many total golf balls are there?

$9 \cdot \frac{b}{9} \geq 15 \cdot 9$

$b \geq 135$

| Inequality | Solution |
|---|---|
| $\frac{b}{9} \geq 15$ | $b \geq 135$ balls |

**2.** Omar is on a diet and eats no more than 1,800 calories per day. If he has consumed 385 calories so far today, how many more calories he can consume?

$C + 385 \leq 1800$

$-385 \quad -385$

$C \leq 1415$

| Inequality | Solution |
|---|---|
| $C + 385 \leq 1800$ | $C \leq 1415$ cal. |

**3.** Elena types approximately 50 words per minute. How many minutes will it take her to type an essay with a maximum of 800 words?

$\frac{50M}{50} \leq \frac{800}{50}$

$M \leq 16$

| Inequality | Solution |
|---|---|
| $50M \leq 800$ | $M \leq 16$ Min |

**4.** Nick drained 2.8 gallons of water from a fish tank. If the amount of water in the fish tank is now less than 24.5 gallons, how many gallons were in the tank before he drained the water?

$g - 2.8 < 24.5$

$+2.8 \quad +2.8$

$g < 27.3$

| Inequality | Solution |
|---|---|
| $g - 2.8 < 24.5$ | $g < 27.3$ gal. |

**5.** A pilot must log a minimum of 1,500 training hours in order to fly an aircraft. If Brett has logged 892 hours so far, how many more hours must he log?

$H + 892 \geq 1500$

$-892 \quad -892$

$H \geq 608$

| Inequality | Solution |
|---|---|
| $H + 892 \geq 1500$ | $H \geq 608$ Hours |

**6.** The value of a baseball card is increasing at a rate of \$40 per year. If Tom purchased the card for \$300, how many years will it take for the card to at least triple in value?

$\frac{40y}{40} \geq \frac{600}{40}$

$y \geq 15$

| Inequality | Solution |
|---|---|
| $40y \geq 900$ | $y \geq 15$ years |

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**7.** Sean's cat weighs at least 45 pounds less than his dog weighs. If his cat weighs 13.8 pounds, how much does his dog weigh?

$D - 13.8 \geq 45$

$+13.8 \quad +13.8$

$D \geq 58.8$

| Inequality | Solution |
|---|---|
| $D - 13.8 \geq 45$ | $D \geq 58.8$ lb |

**8.** Marsha went out to dinner with four of her friends. If each person paid no more than $21.50, what was the total dinner bill?

$(5)\frac{B}{5} \leq 21.5 \cdot (5)$

$B \leq 107.5$

| Inequality | Solution |
|---|---|
| $\frac{B}{5} \leq 21.5$ | $B \leq \$107.50$ |

**9.** Naomi bought fabric on sale for $3.20 per yard. If she spent less than $40, how many yards did purchase?

$\frac{3.20y}{3.20} < \frac{40}{3.20}$

$y < 12.5$

| Inequality | Solution |
|---|---|
| $3.20y < 40$ | $y < 12.5$ yds |

**10.** Lena always keeps her bank account balance above $50. If she spent $11.60 on lunch, what was her balance before buying lunch?

$B - 11.60 > 50$

$+11.60 \quad +11.60$

$B > 61.60$

| Inequality | Solution |
|---|---|
| $B - 11.60 > 50$ | $B > \$61.60$ |

**11.** Sienna listened to music on her phone while she exercised at the gym. If she listened to 12 songs and each song was at least 3.5 minutes long, how many minutes she spend exercising?

$(12)\cdot\frac{M}{12} \geq 3.5 \cdot (12)$

$M \geq 42$

| Inequality | Solution |
|---|---|
| $\frac{M}{12} \geq 3.5$ | $M \geq 42$ Min |

**12.** A football stadium needs to sell no less than 45,000 seats to air a game on TV. If they sold three-fifths of the seats and were able to air the game, how many seats are in the stadium?

$\frac{5}{3} \cdot \frac{3}{5} S \geq 45000 \cdot \frac{5}{3}$

$S \geq 75000$

| Inequality | Solution |
|---|---|
| $\frac{3}{5} S \geq 45000$ | $S \geq 75000$ seats |

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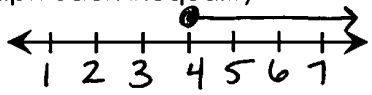
Name: _____ **Math 6**

Date: _____ Per: _____ **Unit 5:** Equations & Inequalities

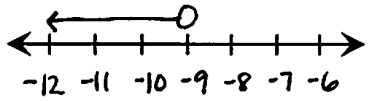
## **Quiz 3-2:** Inequalities

**Directions:** Graph each inequality

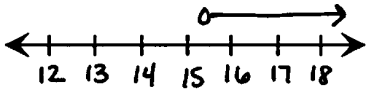
1. $x \geq 4$




2. $c < -9$

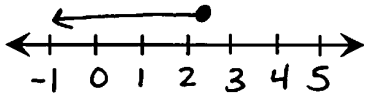



3. $15.3 < m$




$m > 15.3$

4. $2\frac{1}{3} \geq a$




$a \leq 2\frac{1}{3}$

**Directions:** Translate into an inequality using a variable.

5. "A number is less than 8."

6. "A number is at least -13."

5. $n < 8$

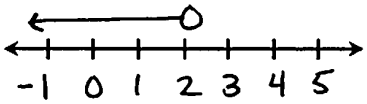
6. $n \geq -13$

**Directions:** Solve and graph the solution each inequality.

7. $x + 7 < 9$

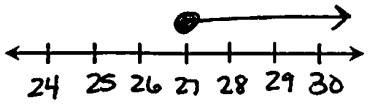
$-7 \quad -7$

$x < 2$




8. $\frac{p}{3} \geq 9$ ·3

$p \geq 27$




9. $6a > 42$

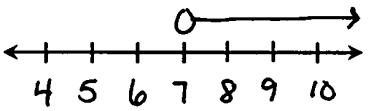
$\frac{6a}{6} > \frac{42}{6}$

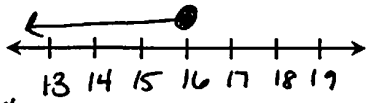
$a > 7$

10. $13 \geq r - 3$

$+3 \quad +3$

$16 \geq r$ $\quad r \leq 16$



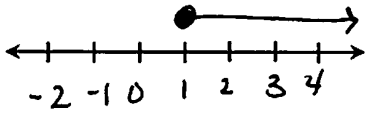

11. $w + 4 \geq 5$

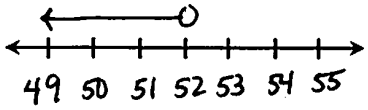
$-4 \quad -4$

$w \geq 1$

12. $4 \cdot 13 > \frac{n}{4} \cdot 4$

$52 > n$ $\quad n < 52$




7. $x < 2$

8. $p \geq 27$

9. $a > 7$

10. $r \leq 16$

11. $w \geq 1$

12. $n < 52$

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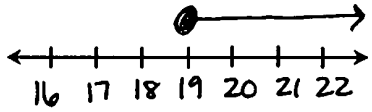
**13.** $0.4m \geq 7.6$

$\frac{0.4m}{0.4} \geq \frac{7.6}{0.4}$

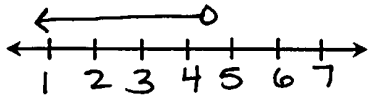
$m \geq 19$




**14.** $13.2 > z + 8.9$

$-8.9 \quad -8.9$

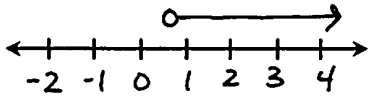
$4.3 > z$ | $z < 4.3$




**15.** $k - \frac{7}{20} > \frac{2}{5}$

$+\frac{7}{20} \quad +\frac{7}{20}$

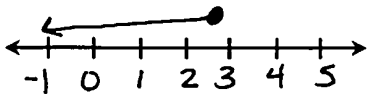
$k > \frac{3}{4}$




**16.** $\frac{7}{8}c \leq 2\frac{9}{20}$

$\frac{8}{7} \cdot \frac{7}{8}c \leq \frac{49}{20} \cdot \frac{8}{7}$

$c \leq \frac{14}{5}$ | $c \leq 2\frac{4}{5}$




| | |
|---|---|
| 13. | $m \geq 19$ |
| 14. | $z < 4.3$ |
| 15. | $k > \frac{3}{4}$ |
| 16. | $c \leq 2\frac{4}{5}$ |

**Directions:** For each problem (a) translate into an inequality using a variable, then (b) solve.

**17.** "The difference of a number and 9 is less than 2."

$n - 9 < 2$

$+9 \quad +9$

$n < 11$

**18.** "The quotient of a number and 7 is a minimum of 4."

$7 \cdot \frac{n}{7} \geq 4 \cdot 7$

$n \geq 28$

**19.** Shiloh needs to sell more than 125 bracelets at a craft fair to make a profit. If she has sold 78 so far, how many more does she need to sell?

$78 + b > 125$

$-78 \quad -78$

$b > 47$

**20.** A fish tank can hold at most 160 gallons of water. If the tank is being filled with water using a hose at a rate of 6.4 gallons per minute, how many minutes can the tank be filled before it overfills?

$\frac{6.4M}{6.4} \leq \frac{160}{6.4}$

$M \leq 25$

| | |
|---|---|
| 17. (a) | $n - 9 < 2$ |
| (b) | $n < 11$ |
| 18. (a) | $\frac{n}{7} \geq 4$ |
| (b) | $n \geq 28$ |
| 19. (a) | $78 + b > 125$ |
| (b) | $b > 47$ bracelets |
| 20. (a) | $6.4M \leq 160$ |
| (b) | $M \leq 25$ Minutes |

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# Unit 5 Test Study Guide
## (Equations & Inequalities)

Name: _____

Date: _____ Per: _____

**Topic 1:** Solving One-Step Equations

**Directions:** Solve each equation. Check all solutions.

**1.** $x-9=15$

$+9 \quad +9$

$x=24$

$24-9=15$

$15=15$ ✓

**2.** $4p=52$

$\frac{4p}{4}=\frac{52}{4}$

$p=13$

$4(13)=52$

$52=52$ ✓

**3.** $13=k+4$

$-4 \quad -4$

$9=k$

$13=9+4$

$13=13$ ✓

**4.** $\frac{c}{4}=7$ ·4

$c=28$

$\frac{28}{4}=7$

$7=7$ ✓

**5.** $z-19=26$

$+19 \quad +19$

$z=45$

$45-19=26$

$26=26$ ✓

**6.** $\frac{24}{8}=\frac{8m}{8}$

$3=m$

$24=8(3)$

$24=24$ ✓

**7.** $25+r=61$

$-25 \quad -25$

$r=36$

$25+36=61$

$61=61$ ✓

**8.** $\frac{m}{2.6}=15$ (2.6)

$m=39$

$\frac{39}{2.6}=15$

$15=15$ ✓

**9.** $16.5=7.9+w$

$-7.9 \quad -7.9$

$8.6=w$

$16.5=7.9+8.6$

$16.5=16.5$ ✓

**10.** $f-\frac{5}{6}=\frac{11}{12}$

$+\frac{5}{6} \quad +\frac{5}{6}$

$f=\frac{7}{4}$

$f=1\frac{3}{4}$

$1\frac{3}{4}-\frac{5}{6}=\frac{11}{12}$

$\frac{11}{12}=\frac{11}{12}$ ✓

**11.** $\frac{3}{4}y=1\frac{7}{8}$ ·$\frac{4}{3}$

$y=\frac{15}{8}\cdot\frac{4}{3}$

$y=\frac{5}{2}$

$y=2\frac{1}{2}$

$\frac{3}{4}(2\frac{1}{2})=1\frac{7}{8}$

$1\frac{7}{8}=1\frac{7}{8}$ ✓

**12.** $4\frac{1}{2}=a\div 6\frac{2}{3}$

$\frac{20}{3}\cdot\frac{9}{2}=a\div\frac{20}{3}\cdot\frac{20}{3}$

$30=a$

$4\frac{1}{2}=30\div 6\frac{2}{3}$

$4\frac{1}{2}=4\frac{1}{2}$ ✓

**Directions:** Write each sentence as an equation. Do not solve.

**13.** "14 subtracted from a number is 11."

$n-14=11$

**14.** "The product of a number and 3 is 72."

$3n=72$

**15.** "The quotient of a number and 4 results in 3."

$\frac{n}{4}=3$

**16.** "9 is the sum of a number and 16."

$9=n+16$

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## Topic 2: One-Step Equation Word Problems

**Directions:** Use a variable to write an equation, then solve. Give both your equation and solution.

**17.** Orlando, Florida is approximately 61 square miles less than the size of Tampa, Florida. If Orlando is 114 square miles, find the size of Tampa.

T = Tampa

$T - 61 = 114$

$+61 \quad +61$

$T = 175$

| Equation | Solution |
|---|---|
| $T - 61 = 114$ | 175 miles |

**18.** Rylan is saving money to purchase a ring for his girlfriend. If he has saved \$825 so far and this is three-fifths of the cost of the ring, how much is the ring?

R = Ring

$\frac{5}{3} \cdot 825 = \frac{3}{5} R \cdot \frac{5}{3}$

$1375 = R$

| Equation | Solution |
|---|---|
| $825 = \frac{3}{5} R$ | \$1375 |

**19.** Nora took a cab that charges \$1.40 per mile from her house to the mall. If the total fare was \$23.80, find the number of miles from her house to the mall.

m = miles

$\frac{1.40m}{1.40} = \frac{23.80}{1.40}$

$m = 17$

| Equation | Solution |
|---|---|
| $1.40m = 23.80$ | 17 miles |

**20.** A recipe calls for $2\frac{3}{4}$ cups of sugar. If Nora has already put in $1\frac{5}{6}$ cups, how many more cups of sugar are needed?

$1\frac{5}{6} + c = 2\frac{3}{4}$

$\frac{11}{6} + c = \frac{11}{4}$

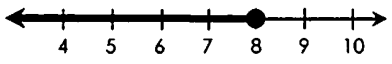
$-\frac{11}{6} \quad -\frac{11}{6}$

$c = \frac{11}{12}$

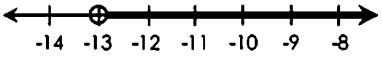
| Equation | Solution |
|---|---|
| $1\frac{5}{6} + c = 2\frac{3}{4}$ | $\frac{11}{12}$ cups |

## Topic 3: Representing Inequalities

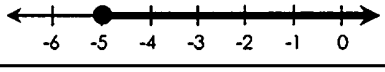
**Directions:** Write an inequality to represent the graph.

**21.** 

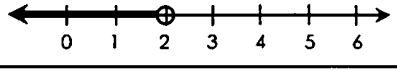
$x \leq 8$

**22.** 

$x > -13$

**23.** 

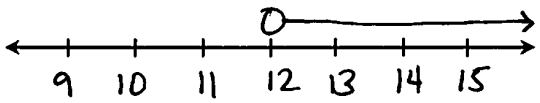
$x \geq -5$

**24.** 

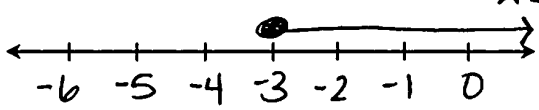
$x < 2$

**Directions:** Write each sentence as an inequality, then graph.

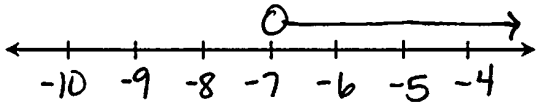
**25.** "A number is greater than 12." $x > 12$



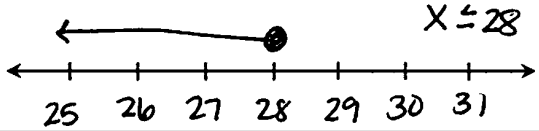

**26.** "A number has a minimum value of -3." $x \geq -3$




**27.** "-7 is fewer than a number." $-7 < x$; $x > -7$




**28.** "The temperature was no more than 28°." $x \leq 28$

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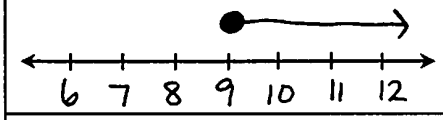
## Topic 4: Solving One-Step Inequalities

**Directions:** Solve and graph the solution to each inequality.

**29.** $a+7 \geq 16$

$-7 \quad -7$

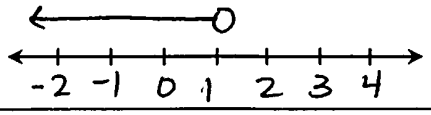
$\boxed{x \geq 9}$




**30.** $7p < 7$

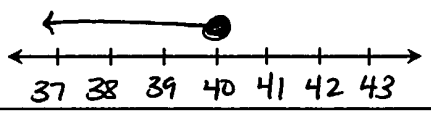
$\frac{}{7} \quad \frac{}{7}$

$\boxed{p < 1}$




**31.** $\frac{m}{5} \leq 8 \cdot 5$

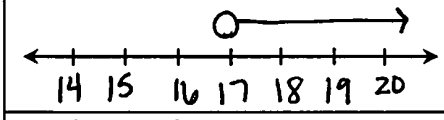
$\boxed{m \leq 40}$




**32.** $9 < x-8$

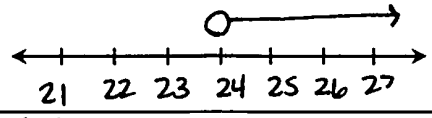
$+8 \quad +8$

$17 < x \qquad x > 17$




**33.** $\frac{r}{8} > 3 \cdot 8$

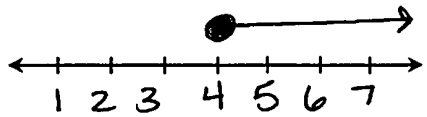
$r > 24$




**34.** $36 \leq 9k$

$\frac{}{9} \quad \frac{}{9}$

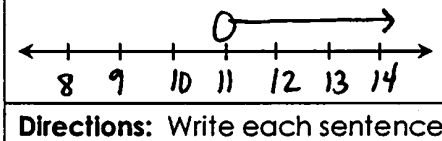
$4 \leq k \qquad k \geq 4$




**35.** $2+w > 13$

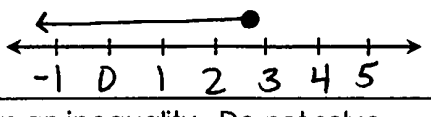
$-2 \quad -2$

$w > 11$




**36.** $\frac{c}{0.2} \leq 13.5 \ (0.2)$

$c \leq 2.7$

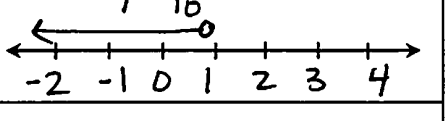



**37.** $y + 2\frac{1}{4} < 3\frac{3}{20}$

$y + \frac{9}{4} < \frac{63}{20}$

$-\frac{9}{4} \quad -\frac{9}{4}$

$y < \frac{9}{10}$




**Directions:** Write each sentence as an inequality. Do not solve.

**38.** "A number increased by 5 is less than or equal to 12."

$n + 5 \leq 12$

**39.** "16 is greater than or equal to twice a number."

$16 \geq 2n$

**40.** "Three-fourths of a number is no less than 60."

$\frac{3}{4}n \geq 60$

**41.** "The difference of a number and 4 has a maximum value of 25."

$n - 4 \leq 25$

## Topic 5: Verifying Solutions

**Directions:** Determine whether the given value is a solution to the inequality.

**42.** $x \geq 6;\ x = -15$

$-15 \geq 6$

no

**43.** $m < -4;\ m = -7$

$-7 < -4$

yes

**44.** $\frac{2}{3} \leq y;\ y = \frac{11}{15}$

$\frac{2}{3} \leq \frac{11}{15}$

yes

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**45.** $p - 5 < 8$; $p = 13$

$13 - 5 < 8$

$8 < 8$

NO

**46.** $2.95 + k \geq 4.8$; $k = 1.9$

$2.95 + 1.9 \geq 4.8$

$4.85 \geq 4.8$

YES

**47.** $\frac{5}{8}a \geq 8$; $a = 12$

$\frac{5}{8}(12) \geq 8$

$7\frac{1}{2} \geq 8$ NO

**Topic 6:** One-Step Inequality Word Problems

**Directions:** Use a variable to write an inequality, then solve. Give both your inequality and solution.

**48.** A group of students went on a field trip. The students were divided into 6 buses and each bus had less than 52 students. How many students went on the field trip?

$S$ = students

$6 \cdot \frac{S}{6} < 52 \cdot 6$

$S < 312$

| Inequality | Solution |
|---|---|
| $\frac{S}{6} < 52$ | $S < 312$ students |

**49.** In their last game, the Eagles and Cowboys scored at least 50 points. If the Eagles scored 16 points, how many points did the Eagles score?

$E$ = Eagles

$E + 16 \geq 50$

$-16 \quad -16$

$E \geq 34$

| Inequality | Solution |
|---|---|
| $E + 16 \geq 50$ | $E \geq 34$ pts |

**50.** A builder bought a section of land to build homes. Of the land he purchased, he can develop no more than 225 acres and leave the rest as open space for wildlife. If he left 128 acres as open space, how much land did he purchase?

$L$ = land

$L - 128 \leq 225$

$+128 \quad +128$

$L \leq 353$

| Inequality | Solution |
|---|---|
| $L - 128 \leq 225$ | $L \leq 353$ acres |

**51.** Tabitha makes $7.50 per hour working at the library. How many hours will she need to work to earn a minimum of $300?

$h$ = hours

$\frac{7.50h}{7.50} \geq \frac{300}{7.50}$

$h \geq 40$

| Inequality | Solution |
|---|---|
| $7.50h \geq 300$ | $h \geq 40$ hrs |

**52.** Adrian's gas tank can hold a maximum of 18.5 gallons. If he stops at a gas station with 3.9 gallons in his tank, much gas can be put in the tank?

$g$ = gallons of gas

$3.9 + g \leq 18.5$

$-3.9 \quad -3.9$

$g \leq 14.6$

| Inequality | Solution |
|---|---|
| $3.9 + g \leq 18.5$ | $g \leq 14.6$ gallons |

**53.** Alex and Troy went for a run. Alex ran $4\frac{2}{3}$ miles, which was at most $\frac{8}{9}$ the distance Troy ran. How far did Troy run?

$T$ = Troy

$4\frac{2}{3} \leq \frac{8}{9}T$

$\frac{9}{8} \cdot \frac{14}{3} \leq \frac{8}{9}T \cdot \frac{9}{8}$

$\frac{21}{4} \leq T$ $\quad T \geq 5\frac{1}{4}$

| Inequality | Solution |
|---|---|
| $4\frac{2}{3} \leq \frac{8}{9}T$ | $T \geq 5\frac{1}{4}$ miles |

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Name: _____

Date: _____ Per: _____

**Unit 5 Test**

Equations & Inequalities

**Solve. Show all work and check each solution.**

**1.** $x - 6 = 11$

$+6 \quad +6$

$x = 17$

$17 - 6 = 11$

$11 = 11$ ✓

$x = 17$

**2.** $\frac{3m}{3} = \frac{24}{3}$

$m = 8$

$3(8) = 24$

$24 = 24$ ✓

$m = 8$

**3.** $13 = \frac{r}{3} \cdot 3$

$39 = r$

$13 = \frac{39}{3}$

$13 = 13$ ✓

$r = 39$

**4.** $18 + p = 30$

$-18 \quad -18$

$p = 12$

$18 + 12 = 30$

$30 = 30$ ✓

$p = 12$

**5.** $\frac{18}{9} = \frac{9k}{9}$

$2 = k$

$18 = 9(2)$

$18 = 18$ ✓

$k = 2$

**6.** $y - 24 = 39$

$+24 \quad +24$

$y = 63$

$63 - 24 = 39$

$39 = 39$ ✓

$y = 63$

**7.** $\frac{c}{3.4} = 8.5$ (3.4)

$c = 28.9$

$\frac{28.9}{3.4} = 8.5$

$8.5 = 8.5$ ✓

$c = 28.9$

**8.** $v - 1\frac{3}{4} = 2\frac{7}{8}$

$v - \frac{7}{4} = \frac{23}{8}$

$+\frac{7}{4} \quad +\frac{7}{4}$

$v = \frac{37}{8}$

$4\frac{5}{8} - 1\frac{3}{4} = 2\frac{7}{8}$

$2\frac{7}{8} = 2\frac{7}{8}$ ✓

$v = 4\frac{5}{8}$

**Translate the equation using a variable. DO NOT SOLVE.**

**9.** "The quotient of a number and 4 is 15"

$\frac{n}{4} = 15$

**10.** "18 subtracted from a number is 26."

$n - 18 = 26$

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**Write an equation to model the problem using a variable, then solve.**

**11.** Miquel worked 5 days last week. If he worked 7.2 hours on average each day, how many hours did he work for the week?

$(5)\cdot\frac{h}{5} = 7.2\cdot(5)$

$h = 36$

| Equation | Solution |
|---|---|
| $\frac{h}{5} = 7.2$ | 36 hrs |

**12.** Beginning at its highest point, a drop tower ride drops 130 feet to a point 95 feet above the ground, then climbs to the top to drop again. What is the highest point of the ride?

$h - 130 = 95$

$+130 \quad +130$

$h = 225$

| Equation | Solution |
|---|---|
| $h - 130 = 95$ | 225 ft |

**13.** Eliza and her mother have a combined age of 51 years. If her mother is 39 years old, how old is Eliza?

$E + 39 = 51$

$-39 \quad -39$

$E = 12$

| Equation | Solution |
|---|---|
| $E + 39 = 51$ | 12 yrs old |

**14.** Clarissa sold five-sixths of the bracelets she made at a craft fair. If she sold 60 bracelets, how many bracelets did she make?

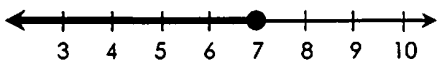
$\frac{6}{5}\cdot\frac{5}{6}b = 60\cdot\frac{6}{5}$

$b = 72$

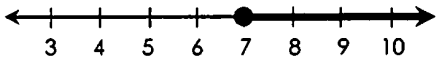
| Equation | Solution |
|---|---|
| $\frac{5}{6}b = 60$ | 72 bracelets |

**15.** Which graph could represent a number that is no more than 7?

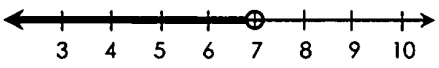
**A.**



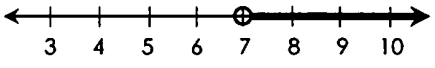

**B.**




**C.**




**D.**




A

**Using the given variable, write an inequality to model the scenario.**

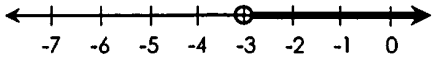
**16.** "There are fewer than 60 candies in the jar" (let $c$ = the number of candies)

$c < 60$

**17.** "Bowlers that score at least 228 points will make it to the next round." (let $p$ = the number of points)

$p \geq 228$

**18.** Which inequalities could represent the graph shown below? Check all that apply.




- ☐ $x < -3$
- ☑ $x > -3$
- ☑ $-3 < x$
- ☐ $-3 > x$

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**Determine whether the given value is a solution to the inequality.**

**19.** $x \geq -16$; $x = -7$

$-7 \geq -16$

☑ yes ☐ no

**20.** $0.15 < k$; $k = 0.098$

$0.15 < 0.098$

☐ yes ☑ no

**21.** $c > -4$; $c = -4$

$-4 > -4$

☐ yes ☑ no

**22.** $w \leq \frac{5}{8}$; $w = \frac{9}{16}$

$\frac{9}{16} \leq \frac{5}{8}$

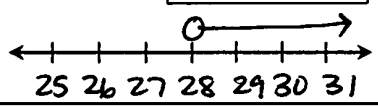
☑ yes ☐ no

**Solve and graph the solution to each inequality.**

**23.** $\frac{a}{7} > 4$ $\cdot 7$

$a > 28$

$a > 28$

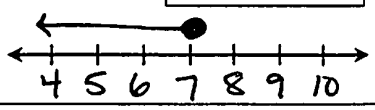



**24.** $n + 2 \leq 9$

$-2 \quad -2$

$n \leq 7$

$n \leq 7$

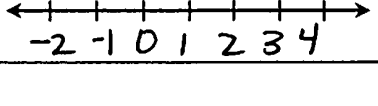



**25.** $12p \geq 12$

$\frac{}{12} \quad \frac{}{12}$

$p \geq 1$

$p \geq 1$



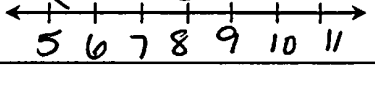

**26.** $21 > 13 + x$

$-13 \quad -13$

$8 > x$

$x < 8$

$x < 8$

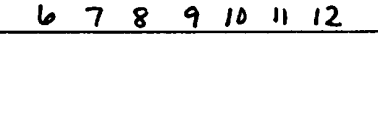



**27.** $5y > 45$

$\frac{}{5} \quad \frac{}{5}$

$y > 9$

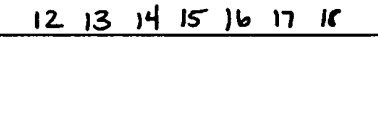
$y > 9$




**28.** $\frac{r}{3} \geq 5$ $\cdot 3$

$r \geq 15$

$r \geq 15$




**29.** $c + 8.9 \leq 10.2$

$-8.9 \quad -8.9$

$c \leq 1.3$

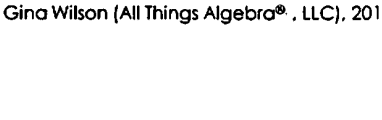
$c \leq 1.3$




**30.** $h \div \frac{2}{3} > \frac{9}{10}$ $\cdot \frac{2}{3}$

$h > \frac{3}{5}$

$h > \frac{3}{5}$

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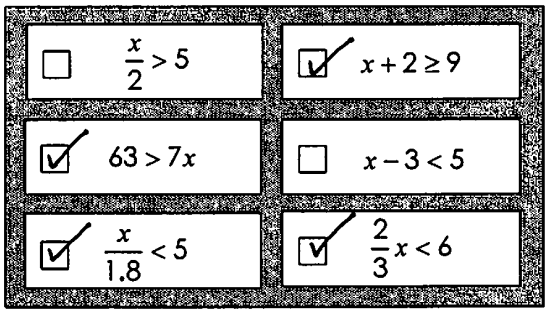
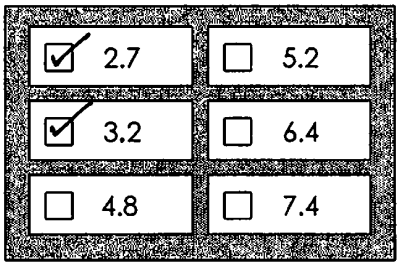
**31.** For which inequalities is 8 a solution? Check all that apply.




**32.** Which values are solutions to the inequality $2.5x < 12$? Check all that apply.




**Translate the inequality using a variable. DO NOT SOLVE.**

**33.** "The sum of a number and 5 is greater than 23."

$n + 5 > 23$

**34.** "The product of a number and 8 has a minimum value of 40 "

$8n \geq 40$

**35.** "One-third of a number is at most 12."

$\frac{1}{3}n \leq 12$

**36.** "15 is no less than a number decreased by 7."

$15 \geq n - 7$

**37.** Jason was driving at most 5 mph below the speed limit. If he was driving 45 mph, which inequality could be used to find the speed limit, $l$?

**A.** $l + 5 \leq 45$

**B.** $l + 5 \geq 45$

**C.** $l - 45 \leq 5$

**D.** $l - 45 \geq 5$

C

**38.** Vera spent \$60 on a box of chocolate bars to sell. If she sells the bars for \$1.50 each, which inequality can be used to find the number of bars she needs to sell, $b$, to make a profit?

**A.** $1.5b < 60$

**B.** $1.5b > 60$

**C.** $1.5b \leq 60$

**D.** $1.5b \geq 60$

B

**Write an inequality to model the problem using a variable, then solve.**

**39.** It took Darcy two days to drive from Orlando to Pittsburgh. She drove 595 miles on the first day and at least 1,020 miles in total. How many miles did she drive on the second day?

$595 + m \geq 1020$
$-595 \quad -595$
$m \geq 425$

| Inequality | Solution |
|---|---|
| $595 + m \geq 1020$ | $m \geq 425$ miles |

**40.** Taylor is buying shares of stock that cost \$8 each. How many shares can be buy if can spend no more than \$250?

$\frac{8s}{8} \leq \frac{250}{8}$

$s \leq 31.25$

| Inequality | Solution |
|---|---|
| $8s \leq 250$ | $s \leq 31$ shares |

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