BASIC ALGEBRA Exam 1A* Name_____

Show all work on this test or on separate paper! **NO CALCULATORS on this test!**

PART 1: (2 points each) Circle your answers!

In 1 - 13, give the value.

1. $6 + 4 \bullet 8$
2. $18 \div 3 \bullet 2$
3. $2 \bullet 5^2$
4. $6 + 4^2 \div (2 + 2)$
5. $(-6)(-4)$
6. $12 \div 0$
7. $0 \div 12$
8. $8 - (-6)$
9. $(-20) - (-12)$
10. $(-4)^2$
11. $(-1)^5$
12. -2^4
13. $(-2)^2 + (-2)^3$

In 14 - 16, given x = 3, y = -2, z = -5, evaluate the following expressions.

14. $y^2 + z^2$
15. $y^2 - 3z^2$
16. $x^2 - xyz$

In 17 – 20, simplify and combine like terms:

17. $3x + 12xy - 7x + 7xy$
18. $3x^2 + 3x + 9x - 9x^2$
19. $4(7x + 5) + 3(8x - 9)$
20. $3(2x - 4) - 9(5x + 8)$

In 21 – 24, give the complete name of the property used:

21. $8 \bullet (3 + 0) = 8 \bullet (3)$ _____
22. $8 \bullet (3 + 0) = (3 + 0) \bullet 8$ _____
23. $8 \bullet (3 + 0) = 8 \bullet (0 + 3)$ _____
24. $8 \bullet (3 + 0) = 8 \bullet (3) + 8 \bullet 0$ _____

PART 2: **(4 points each, partial credit)**

In 25 – 37, solve the equations.

25. $3x + 12 = 36$

26. $-4x - 8 = 20$

27. $2(x-4) + 4(x-5) = -52$

28. $x + 12 = 5x + 36$

29. $2(x-4) - 4(x-5) = 12$

30. $5 - 2(x+8) = 7 - (5x-3)$

In 31 - 33, solve the inequalities; graph on a number line.

31a) $x - 2 \geq 3$

_____

b) $-2 < x < 6$

_____

32. $-3x + 9 \geq 15$

_____

33. $-2 < 4 - 2x \leq 10$

_____

In 34 - 37, give equations and solve the word problems.

34. Six less than twice a number is 4 more than the number. Find the number.

35. Three numbers are such that the second number is twice the first number. The third number is 15 less than the second number. The sum of the numbers is 50. Find the numbers.

36. The length of a rectangle is 8 more than twice the width. The perimeter is 96. Find the dimensions of the rectangle.

37. A box contains 40 coins in quarters and dimes. If the value of the coins is $6.70, how many of each coin are there?

Basic Algebra Exam 1A* Solutions

1. $6+4\cdot 8$
$6+32$
38

2. $18\div 3\cdot 2$
$6\cdot 2$
12

3. $2\cdot 5^2$
$2\cdot 25$
50

4. $6+4^2\div(2+2)$
$6+16\div 4$
$6+4=$ **10**

5. $(-6)(-4)$
24

6. $12\div 0=$ Undefined

7. $0\div 12=0$

8. $8-(-6)$
$8+6$
14

9. $-20-(-12)$
$-20+12$
-8

10. $(-4)^2$
16

11. $(-1)^5$
-1

12. -2^4
-16

13. $(-2)^2+(-2)^3$
$4+(-8)$
-4

14. $(-2)^2+(-5)^2$
$4+25$
29

15. y^2-3z^2
$(-2)^2-3(-5)^2$
$4-3(25)$
$4-75=$ **-71**

16. $3^2-3(-2)(-5)$
$9-30$
-21

17. $3x+12xy-7x+7xy$
$-4x+19xy$
(Any order will do!)

18. $3x^2+3x+9x-9x^2$
$-6x^2+12x$

19. $4(7x+5)+3(8x-9)$
$28x+20+24x-27$
$52x-7$

20. $3(2x-4)-9(5x+8)$
$6x-12-45x-72$
$-39x-84$

21. Identity for addition

22. Commutative for mult.

23. Commutative for add.

24. Distributive

25. $3x+12=36$
$-12\quad -12$
$\frac{3x}{3}=\frac{24}{3}$
$x=8$

26. $-4x-8=20$
$+8\quad +8$
$\frac{-4x}{-4}=\frac{28}{-4}$
$x=-7$

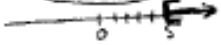
27. $2(x-4)+4(x-5)=-52$
$2x-8+4x-20=-52$
$6x-28=-52$
$+28\quad +28$
$\frac{6x}{6}=\frac{-24}{6}$
$x=-4$

28. $x+12=5x+36$
$-5x\quad -5x$
$-4x+12=36$
$-12\quad -12$
$\frac{-4x}{-4}=\frac{24}{-4}$
$x=-6$

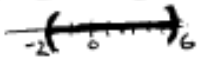
29. $2(x-4)-4(x-5)=12$
$2x-8-4x+20=12$
$-2x+12=12$
$-12\quad -12$
$\frac{-2x}{-2}=\frac{0}{-2}$
$x=0$

30. $5-2(x+8)=7-(5x-3)$
$5-2x-16=7-5x+3$
$-11-2x=10-5x$
$+5x\quad +5x$
$-11+3x=10$
$+11\quad +11$
$3x=21$
$x=7$

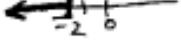
31(a) $x-2\geq 3$
$+2\quad +2$
$x\geq 5$



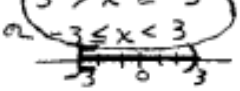
(b) $-2<x<6$



32. $-3x+9\leq 15$
$-9\quad -9$
$\frac{-3x}{-3}\geq\frac{6}{-3}$
$x\leq -2$



33. $-2<4-2x\leq 10$
$-4\quad -4\quad -4$
$\frac{-6}{-2}<\frac{-2x}{-2}\leq\frac{6}{-2}$
$3>x\geq -3$
or **$-3\leq x<3$**



34. Let $x=$ the no.
$2x-6=x+4$
$-x\quad -x$
$x-6=4$
$+6\quad +6$
$x=10$
Ck: $2(10)-6=10+4$

35. Let $x=1^{st}$ no.
$2x=2^{nd}$ no.
$2x-15=3^{rd}$ no.
$x+2x+2x-15=50$
$5x-15=50$
$+15\quad +15$
$\frac{5x}{5}=\frac{65}{5}$
$x=13$ 1st No.
$2x=26$ 2nd No.
$2x-15=11$ 3rd No.
Check: Sum $=13+26+11=50$

36. Let $x=$ width
$2x+8=$ length
$2(\ )+2(\ )=P$
$2(x)+2(2x+8)=96$
$2x+4x+16=96$
$6x+16=96$
$-16\quad -16$
$\frac{6x}{6}=\frac{80}{6}$
$x=13\frac{1}{3}=$ width
$2x+8=26\frac{2}{3}+8=34\frac{2}{3}$ length
Ck: $2(13\frac{1}{3}+34\frac{2}{3})$
$2(48)=96$

37.

No Coins		EA VALUES
Q	x	25	$25(x)$
D	$40-x$	10	$10(40-x)$
			670¢

$25x+10(40-x)=670$
$25x+400-10x=670$
$15x=270$
$x=18$ Q $\rightarrow$ \$4.50
$40-x=22$ D $\rightarrow$ 2.20
\$6.70

BASIC ALGEBRA Exam 1B* **Name**_____

Show all work on this test or on separate paper! **NO CALCULATORS on this test!!**

PART 1: (2 points each) Circle your answers!

In 1 - 13, give the value.

1. $2 + 8 \div 2$
2. $20 \div 4 \bullet 5$
3. $(2 + 5)^2$
4. $5 \bullet 3^2 + 11 - 2^2$
5. $6\ (-4)$
6. $0 \div 6$
7. $6 \div 0$
8. $-6 - (-6)$
9. $2 - |-12|$
10. -4^2
11. $(-4)^2$
12. $(-3)^3$
13. $(-2)^3 - (-2)^2$

In 14 - 16, given x = -5, y = 3, z = -2, evaluate the following expressions.

14. $x^2 - y^2$
15. $2xy + 3yz$
16. $z^2 - x^2$

In 17 – 20, simplify and combine like terms:

17. $5y - 6xy - xy - 12y$
18. $7x^2 - 3x - 9x - 19x^2$
19. $4(5x - 8) - 6(8x - 9)$
20. $3(7x + 9) - (5x + 8)$

In 21 – 24, give the complete name of the property used:

21. $x \bullet (y + 0) = (y + 0) \bullet (x)$ _____
22. $x \bullet (y + 0) = x \bullet y + x \bullet 0$ _____
23. $8 \bullet (3 + -3) = 8 \bullet (0)$ _____
24. $8 \bullet (5 \bullet 3) = (8 \bullet 5) \bullet 3$ _____

PART 2: **(4 points each, partial credit)**

In 25 – 37, solve the equations.

25. $4x - 8 = 32$

26. $-4x + 12 = 20$

27. $5(x-4) + 4(3 - x) = -20$

28. $- x - 12 = 5x + 36$

29. $7 - (x + 4) = 10$

30. $5 + 2(x-8) = 7 - (3 - 5x)$

In 31 - 33, solve the inequalities; graph on a number line.

31a) $2x + 6 \geq 2$

_____

b) $-4 \leq x < 2$

_____

32. $-2x - 4 \geq - 8$

_____

33. $6 < 9 - 3x \leq 15$

_____

In 34 - 37, give equations and solve the word problems.

34. Five less than four times a number is equal to 35 less than twice the number. Find the number.

35. Two consecutive odd numbers are such that twice the second, plus three times the first, is equal to 29. Find the numbers.

36. The second side of a triangle is twice the first, and the third side is 10 more than the second side. The perimeter of the triangle is 70 feet. Find the sides of the triangle.

37. A box contains nickels, dimes, and quarters worth $12.60. The number of dimes is 2 less than three times the number of nickels, and the number of quarters is 4 less than twice the number of dimes. How many of each coin are there?

Basic Algebra Exam 1B* Solutions

1. $2+8\div 2$ → $2+4$ → 6
2. $20\div 4\cdot 5$ → $5\cdot 5$ → 25
3. $(2+5)^2$ → 7^2 → 49
4. $5\cdot 3^2+11-2^2$ → $5\cdot 9+11-4$ → $45+11-4$ → 52
5. $6(-4)$ → -24
6. $0\div 6=0$
7. $6\div 0=$ Undefined

8. $-6-(-6)$ → $-6+6$ → 0
9. $2-|-12|$ → $2-12$ → -10
10. -4^2 → -16
11. $(-2)^4$ → 16
12. $(-3)^3$ → -27
13. $(-2)^3-(-2)^2$ → $-8-4$ → -12

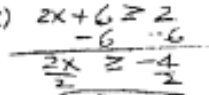
14. $(-5)^2-3^2$ → $25-9$ → 16
15. $2(-5)(3)+3(3)(-2)$ → $-30-18$ → -48
16. $(-2)^2-(-5)^2$ → $4-25$ → -21
17. $5y-6xy-xy-12y$ → $-7y-7xy$
18. $7x^2-3x-9x-19x^2$ → $-12x^2-12x$
19. $4(5x-8)-6(8x-9)$ → $20x-32-48x+54$ → $-28x+22$
20. $3(7x+9)-(5x+8)$ → $21x+27-5x-8$ → $16x+19$

21. Commutative for mult.
22. Distributive
23. Inverse for addition.
24. Associative for mult.

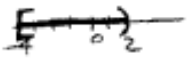
25. $4x-8=32$ → $+8\ +8$ → $\frac{4x}{4}=\frac{40}{4}$ → $x=10$
26. $-4x+12=20$ → $-12\ -12$ → $\frac{-4x}{-4}=\frac{8}{-4}$ → $x=-2$
27. $5(x-4)+4(3-x)=-20$ → $5x-20+12-4x=-20$ → $x-8=-20$ → $+8\ +8$ → $x=-12$

28. $-x-12=5x+36$ → $-5x\ -5x$ → $-6x-12=36$ → $+12\ +12$ → $\frac{-6x}{-6}=\frac{48}{-6}$ → $x=-8$
29. $7-(x+4)=10$ → $7-x-4=10$ → $3-x=10$ → $-3\ -3$ → $\frac{-x}{-1}=\frac{7}{-1}$ → $x=-7$
30. $5+2(x-8)=7-(3-5x)$ → $5+2x-16=7-3+5x$ → $2x-11=4+5x$ → $-5x\ -5x$ → $-3x-11=4$ → $+11\ +11$ → $\frac{-3x}{-3}=\frac{15}{-3}$ → $x=-5$

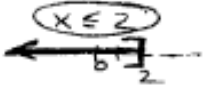
31(a) $2x+6\geq 2$ → $-6\ -6$ → $\frac{2x}{2}\geq\frac{-4}{2}$ → $x\geq -2$



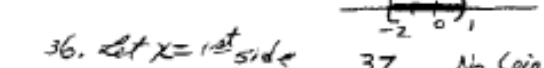
b) $-4\leq x<2$



32. $-2x-4\geq -8$ → $+4\ +4$ → $\frac{-2x}{-2}\geq\frac{-4}{-2}$ → $x\leq 2$



33. $6<9-3x\leq 15$ → $-9\ -9\ -9$ → $\frac{-3}{-3}<\frac{-3x}{-3}\leq\frac{6}{-3}$ → $1>x\geq -2$ or $-2\leq x<1$



34. Let $x=$ the no.
$4x-5=2x-35$ → $-2x\ -2x$ → $2x-5=-35$ → $+5\ +5$ → $\frac{2x}{2}=\frac{-30}{2}$ → $x=-15$

35. Let $x=$ 1st odd no.
$x+2=$ 2nd odd no.
$2(x+2)+3(x)=29$
$2x+4+3x=29$
$5x+4=29$ → $-4\ -4$ → $\frac{5x}{5}=\frac{25}{5}$
$x=5$ 1st No.
$x+2=7$ 2nd No.
Ck: $2\cdot 7+3\cdot 5$
$14+15=29$

36. Let $x=$ 1st side
$2x=$ 2nd side
$2x+10=$ 3rd side
$x+2x+2x+10=70$
$5x+10=70$ → $-10\ -10$ → $\frac{5x}{5}=\frac{60}{5}$
$x=12$ ft.
$2x=24$ ft.
$2x+10=34$ ft.
Perim $=70$ ft.

37.

No	Coins	EA	VALUES
N	x	5	$5(x)$
D	$3x-2$	10	$10(3x-2)$
Q	$6x-4-4$	25	$25(6x-8)$
			1260¢

$5x+10(3x-2)+25(6x-8)=1260$
$5x+30x-20+150x-200=1260$
$185x-220=1260$ → $+220\ +220$ → $185x=1480$
$x=8$ N

$x=8$ N → \$.40N
$3x-2=22$ D → \$2.20D
$6x-8=40$ Q → \$10.00Q
\$12.60