

SHOW ALL WORK ON THIS TEST OR ON SEPARATE PAPER. Circle answers.
TURN IN ALL WORKSHEETS. CALCULATORS ARE REQUIRED ON THIS TEST.

In 1 - 4, evaluate the expressions:

1. $-12 - (-8) + 6(-4)$

2. $-3|6 - 3 \cdot 5|$

3. -2^4

4. $24 \div 6 \cdot 2 + 4 \div 2^2$

5.
$$\frac{(11 - 5)^2 - 3 \cdot 2^2}{(5 - 3)^2 + 4(7 - 2)}$$

In 6 - 7, use a calculator. Give answers in scientific notation or round to the nearest hundredth:

6a) $\sqrt{5800}$

7.
$$\frac{6.3 \times 10^{23} \cdot 9.5 \times 10^{-4}}{7.5 \times 10^{-12} \cdot 8 \times 10^6}$$

b) $\sqrt[3]{5800}$

8. Express without negative exponents and simplify:

$$(3x^{-2})^{-2}$$

9. Simplify:
$$\frac{x^{3a+4} \cdot x^{2a-2}}{x^{a-7}}$$

In 10 - 13, solve for X:

10. $6X - (2X-4) = 6(X-2) - 10$

11. $aX + b = cX + d$

12. $|3X + 6| = 18$

13. $|3X - 6| = -18$

In 14 - 17, solve for X, graph on a number line, and give answers in interval notation.

14. $-2X-6 \geq 4$

15. $-2 < \frac{-2X + 4}{3} \leq 4$

16a) $X \geq -6$ and $X \geq 3$

17a) $X \geq 4$ and $X < -2$

b) $X \geq -6$ or $X \geq 3$

b) $X \geq 4$ or $X < -2$

In 18 - 19, multiply:

18. $(3X + 2Y)^2$

19. $[(3X + 2Y) - 4][(3X + 2Y) - 6]$

In 20 - 21, an equation is required. Show all work!!

20. A box contains nickels, dimes, and quarters worth a total of \$5.00. The number of nickels is three times the number of dimes, and the number of quarters is 4 more than the number of nickels. How many of each coin are there?

22. How much 80% acid solution must be added to 100 liters of 20% acid solution in order to bring the solution up to 60%?

21. A man invests \$2000, some at 5% and the rest at 8%. If the total interest earned in one year was \$124, how much was invested at each rate?

Intermediate Algebra Exam 1E Solutions

1. $-12 - (-8) + 6(-4)$
 $= -12 + 8 - 24$
 $= -28$

2. $-3|6 - 3 \cdot 5|$
 $= -3|6 - 15|$
 $= -3|-9| = -27$

3. -2^4
 $= -(2^4)$
 $= -16$

4. $24 \div 6 \cdot 2 + 4 \div 2^2$
 $= 24 \div 6 \cdot 2 + 4 \div 4$
 $= 4 \cdot 2 + 4 \div 4$
 $= 8 + 1 = 9$

5. $\frac{(11-5)^2 - 3 \cdot 2^2}{(5-3)^2 + 4(7-2)}$
 $= \frac{6^2 - 3 \cdot 2^2}{2^2 + 4(5)}$
 $= \frac{36 - 3 \cdot 4}{4 + 20} = \frac{24}{24} = 1$

6a) $\sqrt{5800} = 76.16$

A) $\sqrt[3]{5800} = 17.97$

7. $(6.3E23 \times 9.5E-4) \div (7.5E-12 \times 8E6)$
 $= \frac{X^4}{9} = 9.975 \times 10^{24}$

8. $(3x^{-2})^{-2}$
 $= 3^{-2} x^4$

9. $x^{3a+4} \cdot x^{2a-2}$
 $= x^{5a+2-(a-7)}$
 $= x^{5a+2-a+7}$
 $= x^{4a+9}$

10. $6x - 2x + 4 = 6x - 12 - 10$
 $4x + 4 = 6x - 22$
 $-4x + 22 - 4x + 22$
 $26 = 2x$
 $x = 13$

11. $ax + b = cx + d$
 $-cx - b - cx - b$
 $ax - cx = d - b$
 $x(a-c) = d-b$
 $\frac{x(a-c)}{a-c} = \frac{d-b}{a-c}$
 $x = \frac{d-b}{a-c}$

12. $|3x+6| = 18$
 $3x+6 = 18$
 $3x = 12$
 $x = 4$

13. $|3x+6| = -18$
 No Solution

14. $-2x - 6 \geq 4$
 $+6 +6$
 $-2x \geq 10$
 $x \leq -5$
 $(-\infty, -5]$

15. $3(-2) < \frac{-2x+4}{3} \leq 3(4)$
 $-6 < -2x+4 \leq 12$
 $-4 -4 -4$
 $-10 < -2x \leq 8$
 $-2 -2 -2$
 $5 > x \geq -4$
 $[-4, 5)$

16. $x \geq -6 \cap x \geq 3$
 a) and $[3, \infty)$
 b) or $[-6, \infty)$

17. $x > 4$ and $x < -2$

a) $(-\infty, -2) \cup [4, \infty)$
 No Solution

18. $(3x+2y)^2$
 $= (3x+2y)(3x+2y)$
 $= 9x^2 + 12xy + 4y^2$

19. $[3x+2y-4][3x+2y-6]$
 $= 9x^2 + 6xy - 18x + 6xy + 4y^2 - 12y - 12x - 8y + 24$
 $= 9x^2 + 12xy + 4y^2 - 30x - 20y + 24$

20.

D	X	10	10(X)
N	3X	5	5(3X)
Q	3X+4	25	25(3X+4)
			500

$10x + 15x + 75x + 100 = 500$
 $100x = 400$
 $x = 4$ D #.40
 $3x = 12$ N .60
 $3x+4 = 16$ Q 4.00

21.

X	.05	.05X
2000-X	.08	.08(2000-X)
		124

$.05x + .08(2000-x) = 124$
 $.05x + 160 - .08x = 124$
 $-.03x = -36$
 $x = 1200 @ 5\%$
 $2000-x = 800 @ 8\%$

22.

X	.80	.80X
100	.20	.20(100)
X+100	.60	.60(X+100)

$.80x + .20(100) = .60(x+100)$
 $.80x + 20 = .60x + 60$
 $.20x = 40$
 $x = 200$ l.