INTERMEDIATE ALGEBRA EXAM 1 X NAME _____

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: (3 pts each part)

1. $20 - 5 \bullet 0$

2. $-8^2 + 6^2$

3. $(16 - 10)^2 \div 4 \bullet 3$

4. $|-5| - 3 \bullet |-8|$

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

6. $\dfrac{18}{18 - 2 \bullet 3}$

7a) $\sqrt{8500}$

8a) $\dfrac{72,000^2}{\sqrt{0.045}}$

b) $\sqrt[3]{8500}$

b) $\dfrac{8.3\times10^{-23} \bullet 9.5\times10^{4}}{7.5\times10^{12} \bullet 4.3\times10^{-6}}$

c) $\sqrt[5]{8500}$

9. Simplify according to the laws of exponents. Express without negative exponents.

a) $3x^{-2}$

b) $\dfrac{x^{-6} \bullet x^{-8}}{x^{-12}}$

c) $\dfrac{2^{6a}}{2^{a-2}}$

In 10 - 13, solve for x: (4 pts each)

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

11. $4x - (6 - 2x) = 6(x - 2) + 6$

12. $|2x - 9| = -3$

13. $|2x - 9| = 3$

In 14 - 17, solve for x, graph on a numberline, and give answers in interval notation.

14. $-3x + 6 \leq -6$

15. $-1 < \frac{3 - x}{3} \leq 5$

16a) $x > -6$ **and** $x \leq 3$

b) $x > -6$ **or** $x \leq -3$

17a) $x \geq -4$ **and** $x > 2$

b) $x \geq -4$ **or** $x > 2$

18. $(2x - 5y)^2$

19. $[(2x - 5y) - 6][(2x - 5y) + 8]$

In 20 - 22, an equation is required. Show all work!!

20. A box contains nickels, dimes, and quarters worth a total of $13.60. The number of dimes is 2 less than three times the number of nickels, and the number of quarters is twice the number of dimes. How many of each coin are there?

21. A woman invests $8,000 in two accounts, some at 6% and the rest at 4%. If the total interest earned in one year is $392, how much was invested at each rate?

22. How much pure acid solution must be added to 60 liters of 20% acid solution in order to create an 80% solution?

INTERMEDIATE ALGEBRA EXAM 1X Solutions

1. $20-5.0$
$20-0$
20

2. -8^2+6^2
$-64+36$
-28

3. $(16-10)^2 \div 4 \cdot 3$
$6^2 \div 4 \cdot 3$
$36 \div 4 \cdot 3$
$9 \cdot 3 = 27$

4. $|-5| - 3 \cdot |-8|$
$5 - 3 \cdot 8$
$5 - 24$
-19

5. $\dfrac{(11-5)^2+3 \cdot 2^2}{(5-3)^2+4(7-2)}$
$\dfrac{6^2+3 \cdot 2^2}{2^2+4 \cdot 5}$
$\dfrac{36+12}{4+20} = \dfrac{48}{24} = 2$

6. $\dfrac{18}{18-2 \cdot 3}$
$\dfrac{18}{18-6}$
$\dfrac{18}{12} = \dfrac{3}{2}$

7a) $\sqrt{8500} = 92.20$

b) $\sqrt[3]{8500} = 20.41$

c) $\sqrt[5]{8500} = 6.11$

8a) $\dfrac{72000^2}{\sqrt{.045}} \approx 2.44 \times 10^{10}$

b) $\dfrac{(8.3E{-}23 \times 9.5E4)}{(7.5E12 \times 4.3E{-}6)} \approx 2.44 \times 10^{-25}$

9a) $3x^{-2} = \dfrac{3}{x^2}$

9b) $\dfrac{x^{-6} \cdot x^{-8}}{x^{-12}}$
$x^{-14-(-12)}$
$x^{-2} = \dfrac{1}{x^2}$

9c) $\dfrac{2^{6a}}{2^{a-2}}$
2^{6a-a+2}
2^{5a+2}

10. $4x-2(2-2x) = 6x-2$
$4x-4+4x = 6x-2$
$8x-4 = 6x-2$
$2x = 2$
$x = 1$

11. $4x-(6-2x) = 6(x-2)+6$
$4x-6+2x = 6x-12+6$
$6x-6 = 6x-6$
True for all x
Identity

12. $|2x-9| = -3$
No Solution

13. $|2x-9| = 3$
$2x-9=3 \quad 2x-9=-3$
$2x=12 \quad 2x=6$
$x=6 \quad x=3$

14. $-3x+6 \le -6$
$-3x \le -12$
$x \ge 4$
$[4, \infty)$

15. $-3 < 3-x \le 15$
$-3 \quad -3 \quad -3$
$-6 < -x \le 12$
$6 > x \ge -12$
$[-12, 6)$

16a) $x > -6$ and $x \le 3$
$(-6, 3]$

b) $x > -6$ or $x \le 3$
$(-\infty, \infty)$

17a) $x \ge -4$ and $x > 2$
$(2, \infty)$

b)
$[-4, \infty)$

18. $(2x-5y)^2 = 4x^2-20xy+25y^2$

19. $[(2x-5y)-6][(2x-5y)+8]$
$(2x-5y)^2+2(2x-5y)-48$
$4x^2-20xy+25y^2+4x-10y-48$

20.

No Coins		EA	VALUES
N	x	5	$5(x)$
D	$3x-2$	10	$10(3x-2)$
Q	$2(3x-2)$ or $6x-4$	25	$25(6x-4)$
			1360

$5x+10(3x-2)+25(6x-4) = 1360$
$5x+30x-20+150x-100 = 1360$
$185x-120 = 1360$
$\dfrac{185x}{185} = \dfrac{1480}{185}$
$x = 8$ N.
$3x-2 = 22$ D
$6x-4 = 44$ Q

21.

	P	R	I
6%	x	.06	$.06x$
4%	$8000-x$	.04	$.04(8000-x)$
			392

$.06x+.04(8000-x) = 392$
$.06x+320-.04x = 392$
$.02x = 72$
$\dfrac{.02x}{.02} = \dfrac{72}{.02}$
$x = 3600$ @ 6%
$8000-x = 4400$ @ 4%

22.

	No Liters	%	PURE
Pure	x	1.00	$1.00(x)$
20%	60	.20	$.20(60)$
80%	$x+60$	.80	$.80(x+60)$

$1.00x+.20(60) = .80(x+60)$
$1.00x+12 = .80x+48$
$-.80x \quad -12 \quad -.80x \quad -12$
$.20x = 36$
$\dfrac{.20x}{.20} = \dfrac{36}{.20}$
$x = 180$ L