INTERMEDIATE ALGEBRA   EXAM 1 GR1   NAME _____

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

In 1 - 4, evaluate the expressions:

1. $(-5) \bullet (-11) + 8 \bullet (-8)$

2. $-2\,[\,3 - 5(4)\,]$

3. $-4^2 - 6^2$

4. $\dfrac{(-2)\sqrt{36} + 14}{12 \div 4 \bullet 3}$

5. $\dfrac{(-2)\sqrt{36} + 14}{12 - 4 \bullet 3}$

6a) $\sqrt{67900}$

7a) $\dfrac{0.000075}{3,000,000}$

b) $\sqrt[3]{67900}$

b) $\dfrac{1.8 \times 10^{12} \bullet 5 \times 10^{6}}{3 \times 10^{-6} \bullet 1.5 \times 10^{4}}$

c) $\sqrt[5]{67900}$

8. Simplify according to the laws of exponents.

$$\dfrac{x^{6a} \bullet x^{4}}{x^{a-2}}$$

In 9 - 12, solve for x:

9. $4x - (2 - 2x) = 6(x - 2) + 10$ 10. $4x - 6(3 - 2x) = 4(x - 2) - 2(2 + 5x)$

11. $|2x - 3| = -7$ 12. $|2x - 3| = 7$

In 13 - 16, solve for x, graph on a numberline, and give answers in interval notation.

13. $-2x + 6 \leq 4$ 14. $-1 < \dfrac{3 - 2x}{5} \leq 3$

15a) $x \geq 6$ and $x \geq -3$ 16a) $x \geq -4$ and $x < 2$

b) $x \geq 6$ or $x \geq -3$ b) $x \geq -4$ or $x < 2$

17. $(5x - 4y)^2$ 18. $[(5x - 4y) - 6][(5x - 4y) + 4]$

In 19 - 21, an equation is required. Show all work!!

19.   A box contains nickels, dimes, and quarters worth a total of $16.75. The number of dimes is twice the number of quarters, and the number of nickels is 5 less than four times the number of dimes. How many of each coin are there?

20.   A woman invests a sum of money at 6% and $3000 more than this at 9%. If the total interest earned in one year is $4170, how much was invested at each rate?

21.   How much water must be added to 60 liters of 20% acid solution in order to dilute the solution to 8%?

1. $(-5)\cdot(-11) + 8\cdot(-8)$
$55 - 64 = \boxed{-9}$

2. $-2[3 - 5(4)]$
$= -2[-17] = \boxed{34}$

3. $-4^2 - 6^2$
$= -16 - 36$
$= \boxed{-52}$

4. $\dfrac{(-2)\sqrt{36} + 14}{12 \div 4 \cdot 3}$
$= \dfrac{(-2)\cdot 6 + 14}{3 \cdot 3}$
$= \dfrac{-12 + 14}{9} = \boxed{\dfrac{2}{9}}$

5. $\dfrac{(-2)\sqrt{36} + 14}{12 - 4\cdot 3}$
$= \dfrac{-12 + 14}{0}$
$= \boxed{\text{Undefined}}$

6a) $\boxed{260.58}$
b) $\boxed{40.80}$
c) $\boxed{9.25}$

7a) $\boxed{2.5 \times 10^{-11}}$
b) $\boxed{2 \times 10^{20}}$
See below
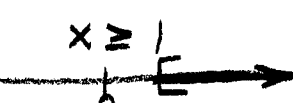
7b) $(1.8\;\boxed{EE}\;12\;\boxed{\times}\;5\;\boxed{EE}\;4\;)$
$\boxed{\div}\;(\;3\;EE\;-6\;\boxed{\times}\;1.5\;EE\;4\;)\;\boxed{=}$

8. $\dfrac{x^{6a}\cdot x^4}{x^{a-2}} = x^{6a+4-(a-2)}$
$= x^{6a+4-a+2}$
$= \boxed{x^{5a+6}}$

9. $4x - (2 - 2x) = 6(x - 2) + 10$
$4x - 2 + 2x = 6x - 12 + 10$
$6x - 2 = 6x - 2$
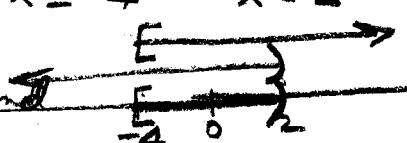$\boxed{\text{All values of } x}$

10. $4x - 6(3 - 2x) = 4(x-2) - 2(2+5x)$
$4x - 18 + 12x = 4x - 8 - 4 - 10x$
$16x - 18 = -6x - 12$
$\underline{+6x + 18 \quad +6x + 18}$
$22x = 6$
$x = 6/22 \text{ or } \boxed{3/11}$
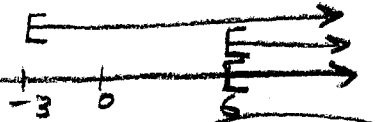
11. $|2x - 3| = -7$
$\boxed{\text{No Solution}}$

12. $|2x - 3| = 7$
$2x - 3 = 7 \qquad 2x - 3 = -7$
$2x = 10 \qquad\qquad 2x = -4$
$\boxed{x = 5 \quad \text{or} \quad x = -2}$

13. $-2x + 6 \leq 4$
$-2x \leq -2$
$x \geq 1$

$\boxed{[1, \infty)}$

14. $5(-1) < 5\left(\dfrac{3-2x}{5}\right) \leq 5(3)$
$-5 < 3 - 2x \leq 15$
$\underline{-3 \quad -3 \qquad -3}$
$\dfrac{-8}{-2} < \dfrac{-2x}{-2} \leq \dfrac{12}{-2}$
$4 > x \geq -6$
$\boxed{[-6, 4)}$

15. $x \geq 6 \qquad x \geq -3$
a) and

$\boxed{[6, \infty)}$

b) or

$\boxed{[-3, \infty)}$

16. $x \geq -4 \qquad x < 2$
a) and

$\boxed{[-4, 2)}$

b) or

$\boxed{(-\infty, \infty)}$

17. $(5x - 4y)^2$
a) $\boxed{25x^2 - 40xy + 16y^2}$
b) $[(5x - 4y) - 6][(5x - 4y) + 4]$
$= (5x - 4y)^2 - 2(5x - 4y) - 24$
$= \boxed{25x^2 - 40xy + 16y^2 - 10x + 8y - 24}$

18.

No Coins	EA	VALUES
Q	x	25	$25x$
D	$2x$	10	$2(10x)$
N	$8x-5$	5	$5(8x-5)$
			1675

$25x + 20x + 40x - 25 = 1675$
$85x = 1700$
$\boxed{x = 20 \; Q}$
$2x = 40 \; D$
$8x - 5 = 155 \; N$

19.

P	$\times$	R	$=$	I
x		$.06$		$.06x$
$20000-x$		$.09$		$.09(20000-x)$
				1560

$.06x + .09(20,000 - x) = 1560$
$.06x + 1800 - .09x = 1560$
$-.03x = -240$
$x = 8000 \; @ 6\%$
$20,000 - x = 12,000 \; @ 9\%$

20.

	%		PURE
H_2O	x	0	0
	60	$.80$	$.80(60)$
	$x+60$	$.20$	$.20(x+60)$

$0 + .80(60) = .20(x + 60)$
$48 = .20x + 12$
$36 = .20x$
$x = \dfrac{36}{.20} = \boxed{180 \ell}$
$x + 60 = \boxed{240 \ell \; 20\%}$