Pre-Calc Algebra Review Notes Name _____

1) Evaluate when $x = 3$ and $y = 2$

a) $5x - 2y$
$5(3) - 2(2)$
$15 - 4$
$= \boxed{11}$

b) $\dfrac{x - 3y}{x}$ $\dfrac{3 - 3(2)}{3}$
$\dfrac{3 - 6}{3} = \dfrac{-3}{3} = \boxed{-1}$

c) $\dfrac{4x}{-2xy}$ $\dfrac{4(3)}{-2(3)(2)} = \dfrac{12}{-12}$
$= \boxed{-1}$

2) Solve for x.

a) $\dfrac{5x}{5} = \dfrac{10}{5}$
$\boxed{x = 2}$

b) $2x - 4 = 10 - 5x$
$\quad +5x \qquad\quad +5x$
$7x - 4 = 10$
$\quad +4 \quad +4$
$\dfrac{7x}{7} = \dfrac{14}{7}$
$\boxed{x = 2}$

c) $\dfrac{12}{3} = \dfrac{3(2x - 8)}{3}$
$4 = 2x - 8$
$+8 \qquad +8$
$\dfrac{12}{2} = \dfrac{2x}{2}$ $\boxed{x = 6}$

3) Do these values form a right triangle?

a) 6, 8, 10
$6^2 + 8^2 \ ? \ 10^2$
$36 + 64 \ ? \ 100$
$100 = 100$
$\boxed{YES}$

b) 5, 12, 14
$5^2 + 12^2 \ ? \ 14^2$
$25 + 144 \ ? \ 196$
$169 \neq 196$
$\boxed{NO}$

c) 9, 40, 41
$9^2 + 40^2 \ ? \ 41^2$
$81 + 1600 \ ? \ 1681$
$1681 = 1681$
$\boxed{YES}$

4) Simplify each expression.

a) $(2x + 3) + (8 + 4x)$
$2x + 3 + 8 + 4x$
$\boxed{6x + 11}$

b) $(8 - 7x) + (-12 - 3x)$
$8 - 7x - 12 - 3x$
$-4 - 10x$
$\boxed{-10x - 4}$

c) $(5 - 2x) - (x - 9)$
$5 - 2x - x + 9$
$\boxed{-3x + 14}$

5) Factor each expression.

a) $x^2 + 5x + 6$
$(x + 3)(x + 2)$

b) $x^2 - x - 12$
$(x - 4)(x + 3)$

c) $x^2 + 2x - 24$
$(x + 6)(x - 4)$

6) Simplify each expression. Express the answer so that all exponents are positive.

a) $(7x^3)^2$
$7^2(x^3)^2$
$\boxed{49x^6}$

b) $\dfrac{x^5 y^3}{x^2 y^6}$
$\boxed{\dfrac{x^3}{y^3}}$

c) $(x^2 y^{-1})^2$
$(x^2)^2 (y^{-1})^2$
$x^4 y^{-2}$
$\boxed{\dfrac{x^4}{y^2}}$

d) $\dfrac{(2xy)^3}{xy^6}$
$\dfrac{2^3 x^3 y^3}{xy^6} = \dfrac{8x^3 y^3}{xy^6}$
$= \boxed{\dfrac{8x^2}{y^3}}$

7) Multiply each expression.   FOIL, BOX METHOD, OR DISTRIBUTE

a) (x + 2) (x + 4)

	x	2
x	x^2	2x
4	4x	8

$$\boxed{x^2 + 6x + 8}$$

b) $(2x - 3)(x^2 + 2x + 4)$

	x^2	2x	4
2x	$2x^3$	$4x^2$	8x
-3	$-3x^2$	-6x	-12

$$\boxed{2x^3 + 1x^2 + 2x - 12}$$

c) $(x + 5)(x^2 - x - 4)$

	x^2	-1x	-4
x	x^3	$-1x^2$	-4x
5	$5x^2$	-5x	-20

$$\boxed{x^3 + 4x^2 - 9x - 20}$$

8) Identify the slope of each equation of line.   MIGHT HAVE TO SOLVE FOR "Y" FIRST.

a) y = 3x − 5

$$\boxed{Slope = 3}$$

b) 2y − 4x = 8

$+4x \quad +4x$

$\dfrac{2y}{2} = \dfrac{8}{2} + \dfrac{4x}{2}$
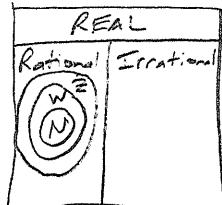
$y = 4 + 2x$

$$\boxed{Slope = 2}$$

c) 2x + 3y = 6

$-2x \qquad -2x$

$\dfrac{3y}{3} = \dfrac{6}{3} - \dfrac{2x}{3}$

$y = 2 - \dfrac{2}{3}x$

$$\boxed{Slope = -2/3}$$

9) Describe each number set.

a) Real Numbers R − all #'s
b) Natural Numbers N − counting #'s   1, 2, 3, ...
c) Whole Numbers W − counting #'s, including zero   0, 1, 2, 3
d) Integers Z − neg + pos #'s and zero, no decimals, no fractions   ...-2,-1, 0, 1, 2,...
e) Rational Numbers Q − fractions, repeat decimals, terminating decimals
f) Irrational Numbers I − non - repeat, non - terminating, $\sqrt{5}$, π

10) List every category (natural, whole, integer, rational, irrational, and real) to which
each number belongs:

$$N \quad W \quad Z \quad Q \quad I \quad R$$

a) -12.3
Real
Rational

b) -11
Real
Integer
Rational

c) $-\sqrt{2}$
Real
Irrational

d) $\dfrac{3}{4}$
Real
Rational

e) 4.6666666
Real
Rational

f) 3
Real
Natural
Whole
Integer
Rational