Name: ___KEY___

Read all directions and problems <u>carefully</u>! Show all appropriate work for credit.
SET UP the equations for the following word problems, but <u>DO NOT SOLVE</u>.

1. The distance between Charlottte, NC and Buffalo, NY is 700 miles. Ralph leaves Charlotte traveling toward Buffalo at an average rate of 56 miles per hour. At the same time, Pottsie leaves Buffalo traveling toward Charlotte at an average rate of 44 miles per hour. Assuming they are traveling on the same route, how long will it take until they meet? (11 pts.)

	r	•	t	#	d
RALPH	$56 \frac{MI}{HR}$	•	t	=	$56t$
POTTSIE	$44 \frac{MI}{HR}$	•	t	=	$44t$
TOTAL	✕		✕		$700\ MI$

LET t = TRAVEL TIME
FOR EACH (SAME)

$$56t + 44t = 700$$

(+11)

2. A locksmith installed inside and outside locks in a new classroom building. The locksmith paid $1216 for 80 locks. If inside locks cost $14 each and outside locks cost $26 each, how many of each kind of lock did he buy? (11 pts.)

LET X = # OF CHEAP LOCKS

	COST PER LOCK	•	# OF LOCKS	=	TOTAL COST
CHEAP LOCKS	$14	•	X	=	$14X$
EXPENSIVE	$26	•	$(80-X)$	=	$26(80-X)$
TOTAL	✕		80 LOCKS		$1216

$$14X + 26(80-X) = 1216$$

(+11)

3. How many ounces of a 10% baking soda solution must be added to 40 ounces of a 2% baking soda solution to make a 5% baking soda solution? (11 pts.)
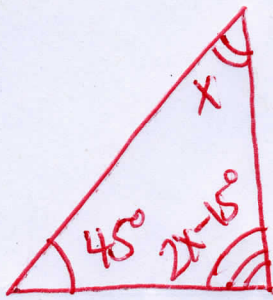
LET X = AMT OF 10% B.S.

	%-AGE (DECIMAL)	•	AMT	=	PURE B.S.
10% BS	.10	•	X	=	$.10X$
2% BS	.02	•	$40\ oz$	=	$.02(40)$
5% BS	.05	•	$(X+40)$	=	$.05(X+40)$

$$.10X + .02(40) = .05(X+40)$$

(+11)

33

4. In a triangle, the middle angle is 45° and the largest angle is 15° less than twice the smallest angle. Find the smallest and largest angles. (11 pts.)
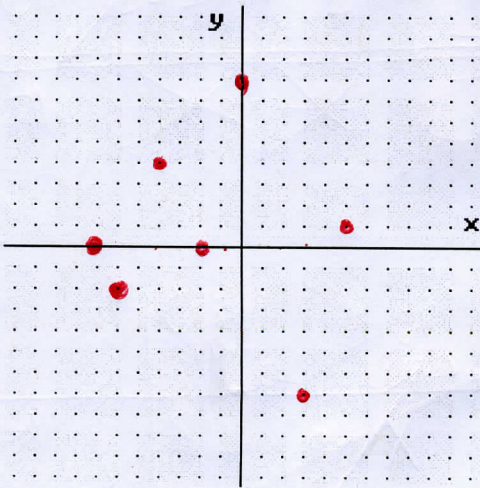
LET X = THE MEASURE OF THE SMALLEST ANGLE

$2X - 15$ = THE LARGEST ANGLE

$$X + 45° + 2X - 15° = 180°$$

(+11)

5. Plot each of the following points **and** state in which quadrant or on which axis each lies. (14 pts.) $(3, -7), (-4, 4), (5, 1), (-6, -2), (0, 8), (-7, 0), (-2, 0)$

QIV   QII   QI   QIII   Y-AXIS   X-AXIS   X-AXIS

(+14)

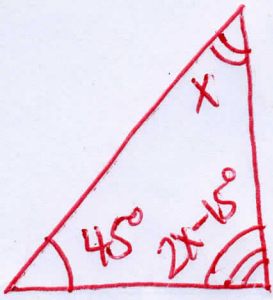6. Complete the following table for the equation $3x + 3y = 6$. (10 pts.)

x	y
2	0
-3	5
1	1
2	0
5	-3

(+10)

$3x + 3(0) = 6$

$\frac{3x}{3} = \frac{6}{3}$

$X = 2$

$3(-3) + 3y = 6$

$+9 \qquad +9$

$\frac{3y}{3} = \frac{15}{3}$

$y = 5$

$3x + 3(1) = 6$

$-3 \quad -3$

$\frac{3x}{3} = \frac{3}{3}$

$X = 1$

$3(2) + 3y = 6$

$-6 \qquad -6$

$\frac{3y}{3} = \frac{0}{3}$

$y = 0$

$3x + 3(-3) = 6$

$+9 \quad +9$

$\frac{3x}{3} = \frac{15}{3}$

$X = 5$

35

4. In a triangle, the middle angle is 45° and the largest angle is 15° less than twice the smallest angle. Find the smallest and largest angles. (11 pts.)
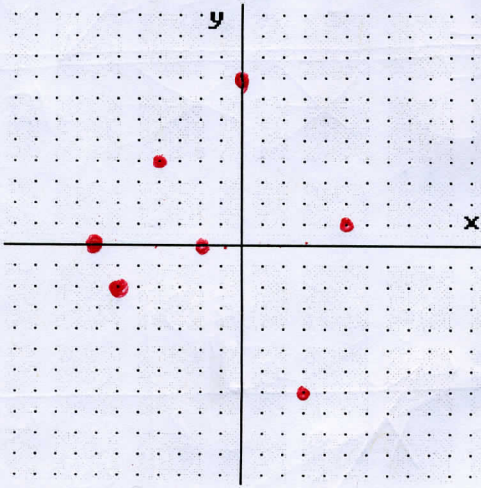
LET X = THE MEASURE OF THE
SMALLEST ANGLE

$2X - 15 =$ THE LARGEST ANGLE

$$X + 45° + 2X - 15° = 180°$$

(+11)

5. Plot each of the following points **and** state in which quadrant or on which axis each lies. (14 pts.) $(3, -7), (-4, 4), (5, 1), (-6, -2), (0, 8), (-7, 0), (-2, 0)$

QIV QII QI QIII Y-AXIS X-AXIS X-AXIS

(+14)

6. Complete the following table for the equation $3x + 3y = 6$. (10 pts.)

x	y
2	0
-3	5
1	1
2	0
5	-3

(+10)

$3x + 3(0) = 6$
$\frac{3x}{3} = \frac{6}{3}$
$X = 2$

$3(-3) + 3y = 6$
$+9 \quad +9$
$\frac{3y}{3} = \frac{15}{3}$
$y = 5$

$3x + 3(1) = 6$
$-3 \quad -3$
$\frac{3x}{3} = \frac{3}{3}$
$X = 1$

$3(2) + 3y = 6$
$-6 \quad -6$
$\frac{3y}{3} = \frac{0}{3}$
$Y = 0$

$3x + 3(-3) = 6$
$+9 \quad +9$
$\frac{3x}{3} = \frac{15}{3}$
$X = 5$

35

7. Complete the following ordered pairs for the given linear equation, and graph the solutions set on the axes provided. (10 pts.)

$$5x - 4y = 12 \; ; \; (-2, -\tfrac{11}{2}), (4, 2), (0, -3), (-4, -8), (\tfrac{12}{5}, 0)$$

$5(-2) - 4y = 12$
$+10 \qquad +10$
$-4y = 22$
$\overline{-4} \quad \overline{-4}$
$y = -\tfrac{11}{2}$

$5x - 4(2) = 12$
$+8 \quad +8$
$5x = 20$
$\overline{5} \quad \overline{5}$
$x = 4$

⊕ +10

$5(0) - 4y = 12$
$\quad -4 \quad -4$
$y = -3$

$5x - 4(-8) = 12$
$5x + 32 = 12$
$-32 \quad -32$
$5x = -20$
$\overline{5} \quad \overline{5}$
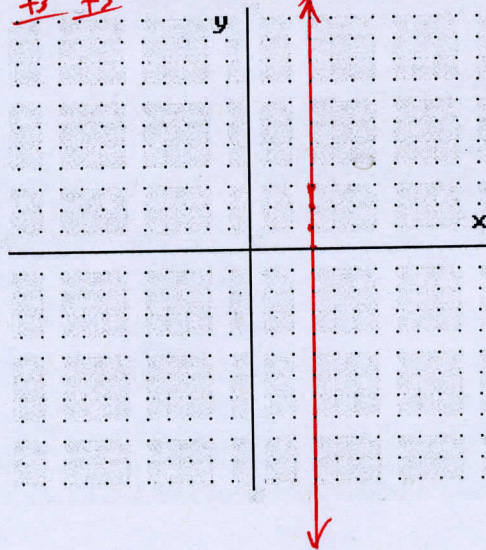$x = -4$

$5x - 4(0) = 12$
$\overline{5} \qquad \overline{5}$
$x = \tfrac{12}{5}$

8. Graph the lines on the axes provided. (10 pts.)
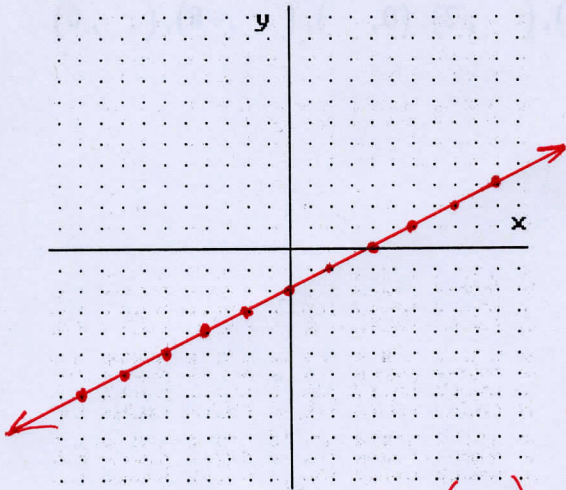
$y = -5 \Rightarrow$ NO X. SO NO X-INT.
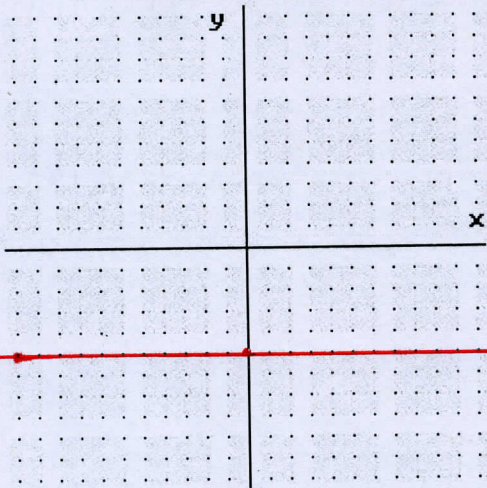
(1,-5)
(2,-5)
(3,-5)

$x - 3 = 0 \Rightarrow X = 3$; NO Y. SO NO Y-INT
$+3 \quad +3$

(3,0)
(3,1)
(3,2)

20

9. Graph the following line $-2x + 4y = -8$ using the intercept method. Label at least four total points on the line. (12 pts.)

$Y\text{-INT.} \Rightarrow X = 0$

$-2(0) + 4y = -8$

$\dfrac{4y}{4} = \dfrac{-8}{4}$

$\boxed{(0, -2)}$

(+4)

$y = -2$

$X\text{-INT.} \Rightarrow y = 0$

$-2x + 4(0) = -8$

$\dfrac{-2x}{-2} = \dfrac{-8}{-2}$

$\boxed{(4, 0)}$

(+4)

$X = 4$

$(-2, -3); \left(1, -1\tfrac{1}{2}\right); (2, -1); (6, 1); (8, 2)$

$(-4, -4)$

(+4)

12