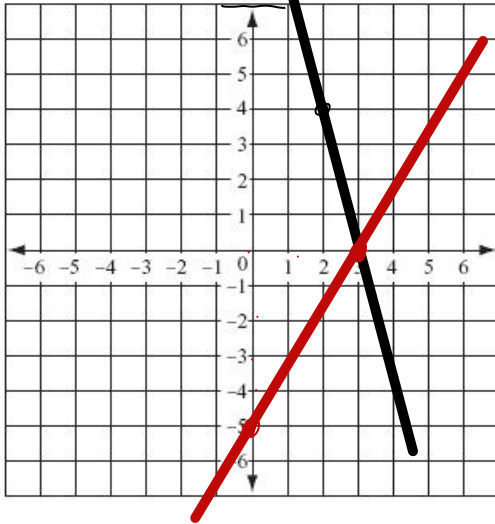Solving Systems Review   Name: _____

Solve the given system of equations by the indicated methods.

1. Solve by graphing

$4x + y = 12$ $5x - 3y = 15$

Rewrite the equations in slope intercept form.
y=mx+b

$y = -4x + 12$

$5x - 3y = 15$
$-5x \quad -5x$

$\dfrac{-3y}{-3} = \dfrac{-5x + 15}{-3} \quad \dfrac{15}{-3}$

$y = \dfrac{5}{3}x - 5$

Solution (3 , 0)

2. Solve by the substitution method. Show all work.

$4x + y = 12 \rightarrow y = -4x + 12$
$5x - 3y = 15$

$5x - 3(-4x + 12) = 15$
$5x + 12x - 36 = 15$
$17x - 36 = 15$
$ +36 \quad +36$ $x = 3$

$\dfrac{17x}{17} = \dfrac{51}{17}$ $(3,0)$

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

$(3,0)$

3. Solve by the elimination method. Show all work.

$3(4x + y = 12) \quad 12x + 3y = 36$
$5x - 3y = 15 \quad 5x - 3y = 15$

$\dfrac{17x}{17} = \dfrac{51}{17}$

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

$(3,0)$

Word problems – remember, set up what you know and then use **ELIMINATION**!

4. A field goal is 3 points and the extra point after a touchdown is 1 point. In a recent post-season, Adam Vinatieri of the Indianapolis Colts made a total of 21 field goals and extra-point kicks for a total of 49 points. Find the number of field goals and extra points that he made.

$X = $ Field goals
$y = $ extra pt

$-1(X + y = 21)$ → $-X - y = -21$
$3X + y = 49$ → $3X + y = 49$

$\dfrac{2X = 28}{2} \quad \dfrac{}{2}$

$\boxed{X = 14 \text{ Field goals}}$

$-14 + y = 21$
$-14 \qquad -14$

$\boxed{y = 7 \text{ extra pts}}$

5. A staffing agency for in-home nurses and support staff places necessary personal at locations on a daily basis. Each placed nurse works 240 minutes per day at a daily rate of $90. Each support staff employee works 360 minutes per day at a daily rate of $120. On a normal day, a total of 3000 minutes are worked by nurses and support staff which results in a total of $1050 earned between the two groups. How many nurses and support staff are placed on a normal day?

$X = $ nurse
$y = $ supp. staff

$240x + 360y = 3000$ → $240x + 360y = 3000$
$-3(90x + 120y = 1050)$ → $-270x - 360y = -3150$

$\dfrac{-30X = -150}{-30} \quad \dfrac{}{-30}$

$\boxed{X = 5 \text{ nurses}}$

$90(5) + 120y = 1050$
$450 + 120y = 1050$
$-450 \qquad\qquad -450$

$\dfrac{120y = 600}{120} \quad \dfrac{}{120}$

$\boxed{y = 5 \text{ supp staff}}$

6. Your teacher wants to see if you can guess your two quiz grades. She tells you that the second quiz is 21 points higher than the first quiz. She also tells you that twice the first quiz grade is 57 points more than the second quiz grade. What were your two quiz grades?

$X = $ Quiz 1
$y = $ Quiz 2

$y = \boxed{X + 21}$

$2x = 57 + y$

$2x = 57 + X + 21$
$2x = X + 78$
$-X \quad -X$

$\boxed{X = 78 \text{ 1st Quiz}}$

$y = 78 + 21$

$\boxed{y = 99 \text{ 2nd Quiz}}$