8th Grade Math
Mr. Willimann
U3 Test Review #4

Name: Key

Date: _____ Class: _____

1) Determine the slope and y-intercept of each equation. *Hint: The equations are written in standard form and must be rewritten in slope intercept form.* ($y = mx + b$)

A) $10x + y = 5$

$-10x \quad -10x$

$y = -10x + 5$

$m = -10$ $b = 5$

B) $-6x + y = 11$

$+6x \quad +6x$

$y = 6x + 11$

$m = 6$ $b = (0, 11)$

C) $9x - 3y = -15$

$-9x \quad -9x$

$\frac{-3y}{-3} = \frac{-9x - 15}{-3}$

$y = 3x + 5$

$m = 3$ $b = 5$

2) A) Kate is walking home from school. After 2 minutes of walking she is 825 meters from home. Then, after walking for 8 minutes she is 375 meters from her house. Write an equation in slope-intercept form that models the distance, *y*, Kate is for her house for the number of minutes she has walked, *x*.

$(2, 825) \& (8, 375)$

$m = \frac{375 - 825}{8 - 2} = \frac{-450}{6} = -75$

$m = -75 \quad x = 2 \quad y = 825$

$825 = -75(2) + b$

$825 = -150 + b$

$+150 \quad +150$

$975 = b$

$m = -75$

$b = 975$

Equation: $y = -75x + 975$

B) Using your equation, determine how many minutes, *x*, it will take for Kate to get home. **(x - intercept)**

$y = 0 \quad x = ?$

$0 = -75x + 975$

$-975 \quad -975$

$\frac{-975}{-75} = \frac{-75x}{-75}$

$x = 13$ minutes

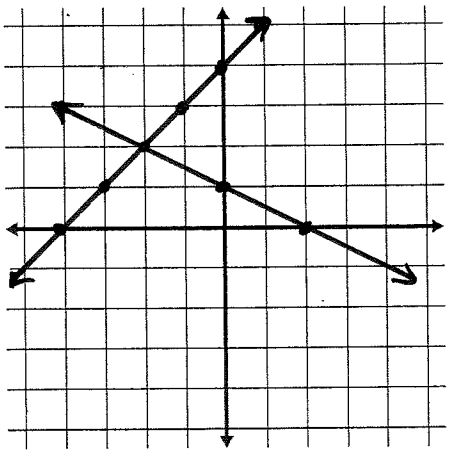
C) How far away is away is Kate's house from her school? **(y - intercept)**

975 meters

3) Solve the following systems of equations by graphing. Write the solution as a ordered pair.

A) $y = x + 4$

$y = \frac{1}{2}x + 1$

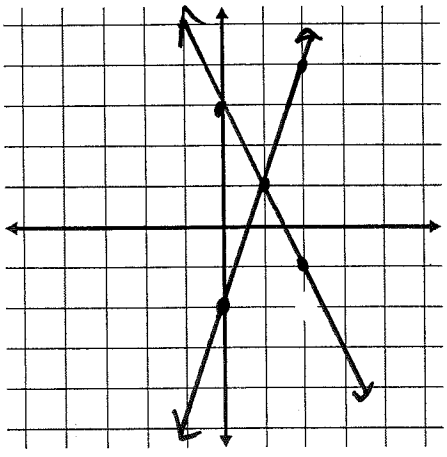


Solution

$(-2, 2)$

B) $y = 3x - 2$

$y = -2x + 3$



Solution

$(1, 1)$

4) Solve the following systems of equations algebraically. If there is one solution, write the solution as an ordered pair. Remember it's possible for the system to result in no solutions or infinite solutions too.

A) $y = 3x - 6$
$y = 8x + 4$

$8x+4=3x-6$
$-3x \quad -3x$
$5x+4=-6$
$-4 \quad -4$
$5x=-10$
$\frac{5x}{5}=\frac{-10}{5}$
$x=-2$

$y=3(-2)-6$
$y=-6-6$
$y=-12$

Solution
$(-2, -12)$

B) $y = -3x + 5$
$y = -3x - 2$

$-3x+5=-3x-2$
$+3x \quad +3x$
$5 \neq -2$

No Solutions

Solution
$(\_\_\_, \_\_\_)$

C) $y = -4x + 15$
$y = 2x - 3$

$2x-3=-4x+15$
$+4x \quad +4x$
$6x-3=15$
$+3 \quad +3$
$6x=18$
$\frac{6x}{6}=\frac{18}{6}$
$x=3$

$y=2(3)-3$
$y=6-3$
$y=3$

Solution
$(3, 3)$

D) $y = 5x - 3$
$3x - 8y = 24$

$3x-8(5x-3)=24$
$3x-40x+24=24$
$-37x+24=24$
$-24 \quad -24$
$-37x=0$
$\frac{-37x}{-37}=\frac{0}{-37}$
$x=0$

$y=5(0)-3$
$y=-3$

Solution
$(0, -3)$

E) $6x - 5y = 12$
$y = -2x + 20$

$6x-5(-2x+20)=12$
$6x+10x-100=12$
$16x-100=12$
$+100 \quad +100$
$16x=112$
$\frac{16x}{16}=\frac{112}{16}$
$x=7$

$y=-2(7)+20$
$y=-14+20$
$y=6$

Solution
$(7, 6)$

F) $8x - 2y = 12$
$y = 4x - 6$

$8x-2(4x-6)=12$
$8x-8x+12=12$
$12=12$

Infinite Solutions

Solution
All Real #s
$(\_\_\_, \_\_\_)$

Write and solve a system of equations that represents each situation. **Interpret each solution.**

5) Erin and Jake worked a total of 75 hours last week. Erin worked 11 more hours than Jake. How many hours did each person work?

Define Variables

e = hours Erin worked

j = hours Jake worked

Equation 1 → $e+j=75$

Equation 2 → $e=j+11$

$j+11+j=75$
$2j+11=75$
$-11 \quad -11$
$2j=64$
$\frac{2j}{2}=\frac{64}{2}$
$j=32$

$e=32+11$
$e=43$

Solution
$(32, 43)$

Solution Interpretation → Jake worked 32 hours, Erin worked 43 hours

6) Tamie wants to get t-shirts for her club at school. She has narrowed it down to two companies to make the shirts. Company 1 makes shirts for $8 a shirt in addition to a one time service fee of $20. Company 2 charges a onetime service fee of $50 and then $5 per shirt. After how many shirts will the two companies cost the same and what will the cost of be when the two companies are equal?

Define Variables

y = total cost

x = number of shirts

Equation 1 → $y = 8x + 20$

Equation 2 → $y = 5x + 50$

$8x + 20 = 5x + 50$

$-5x \quad -5x$

$3x + 20 = 50$

$-20 \quad -20$

$\frac{3x}{3} = \frac{30}{3}$

$x = 10$

$y = 8(10) + 20$

$y = 80 + 20$

$y = 100$

Solution

(10, 100)

Solution Interpretation → At 10 shirts both companies will cost $100

7) Nate and Ricky are selling pizzas for a school fundraiser. Together they sell a total of 36 pizzas. Ricky sold twice the amount of pizzas that Nate sold. How many pizzas did each person sell?

Define Variables

n = pizzas nate sold

r = pizzas Ricky sold

Equation 1 → $n + r = 36$

Equation 2 → $r = 2n$

$n + 2n = 36$

$\frac{3n}{3} = \frac{36}{3}$

$n = 12$

$r = 2(12)$

$r = 24$

Solution

(12, 24)

Solution Interpretation → Nate sold 12 pizzas and Ricky sold 24 pizzas

8) The 8th Grade class at NHMS has 56 students. There are 8 more girls than boys in the class. How many girls are in the class? How many boys are in the class?

Define Variables

b = boys

g = Number of girls

Equation 1 → $b + g = 56$

Equation 2 → $g = b + 8$

$b + b + 8 = 56$

$2b + 8 = 56$

$-8 \quad -8$

$\frac{2b}{2} = \frac{48}{2}$

$b = 24$

$g = 24 + 8$

$g = 32$

Solution

(24, 32)

Solution Interpretation → There are 24 boys and 32 girls

9) Leslie Knope wants to buy a banner for an upcoming event. Alvin's Advertising makes banners for $14 plus $0.35 per letter that is on the sign. Sarah's Signs charge a one-time fee of $8 and then $0.50 per letter put on the sign. After how many letters will the two companies cost the same and what will the cost of be when the two companies are equal?

Define Variables

c = cost

n = number of letters

Equation 1 → $c = 0.35n + 14$

Equation 2 → $c = 0.50n + 8$

$0.35n + 14 = 0.50n + 8$

$-0.35n \quad -0.35n$

$14 = 0.15n + 8$

$-8 \quad -8$

$6 = 0.15n$

$\frac{6}{0.15} = \frac{0.15n}{0.15}$

$40 = n$

$c = 0.35(40) + 14$

$c = 14 + 14$

$c = 28$

Solution

(40, 28)

Solution Interpretation → At 40 letters the two companies will both cost $28