EMA

Unit 3 Review – Solving & Linear Applications

Name: Key

Date: _____ Period: _____

Solve.

1.) $2+5(4x-3)-5(x-7)=2(3x+6)-4x$

$2+20x-15-5x+35=6x+12-4x$

$15x+22=2x+12$

$13x=-10$

$\boxed{x=\frac{-10}{13}}$

2.) $\frac{3}{(4x-1)}=\frac{5}{(2x+3)}$

$5(4x-1)=3(2x+3)$

$20x-5=6x+9$

$14x=14$

$\boxed{x=1}$

3.) $\frac{3(a-b)}{c}=4$; **Solve for *a*.**

$3(a-b)=4c$

$(a-b)=\frac{4c}{3}$

$\boxed{a=\frac{4c}{3}+b}$

4.) $\frac{1}{6}x-\frac{3}{2}=\frac{5}{12}x-2$

$\frac{1}{2}=\frac{1}{4}x$

$\boxed{2=x}$

5.) **Mr. Bruell loves picking apples. Back in his prime, he could pick 732 in 1 ½ hours. That's right!! 732 apples in 1 hour and 30 minutes!!! If that is the case, how many could he pick if he spent 8 hours picking apples?**

$\frac{\text{Apples}}{\text{Hours}}: \quad \frac{732}{1\frac{1}{2}}=\frac{x}{8}$

$1.5x=5856$

$\boxed{x=3904 \text{ Apples}}$

$x_1\ y_1 \qquad x_2\ y_2$

6.) **Write an equation in *slope – intercept form* given the line passes through the points $(-1,-3)$ and $(-2,6)$.**

$m = \frac{y_2-y_1}{x_2-x_1} = \frac{6-(-3)}{-2-(-1)} = \frac{9}{-1} = -9$

$(-2,6)$

$y-y_1 = m(x-x_1)$

$y-6 = -9(x-(-2))$

$y-6 = -9x-18$

$\boxed{y=-9x-12}$

or

$y=mx+b$

$6 = -9(-2)+b$

$6 = 18+b$

$-12 = b$

$\boxed{y=-9x-12}$

7.) **Write an equation in *slope-intercept form* that is *parallel* to your equation in #6 and passes through the point $(2,-7)$.**

$\parallel$ $m=-9$

$(2,-7)$

$y-y_1 = m(x-x_1)$

$y-(-7) = -9(x-2)$

$y+7 = -9x+18$

$\boxed{y=-9x+11}$

or

$y=mx+b$

$-7 = -9(2)+b$

$-7 = -18+b$

$11 = b$

$\boxed{y=-9x+11}$

8.) **Write an equation in *slope-intercept form* that is *perpendicular* to your equation in #6 and passes through the point $(-9,1)$.**

$\perp$ $m=\frac{1}{9}$

$(-9,1)$

$y-y_1 = m(x-x_1)$

$y-1 = \frac{1}{9}(x-(-9))$

$y-1 = \frac{1}{9}x+1$

$\boxed{y=\frac{1}{9}x+2}$

or

$y=mx+b$

$1 = \frac{1}{9}(-9)+b$

$1 = -1+b$

$2 = b$

$\boxed{y=\frac{1}{9}x+2}$

9.) **Graph each equation from numbers 6, 7, and 8. Label each one respectively A, B, and C.**

Equation from #6: $y=-9x-12$ **. Label A**

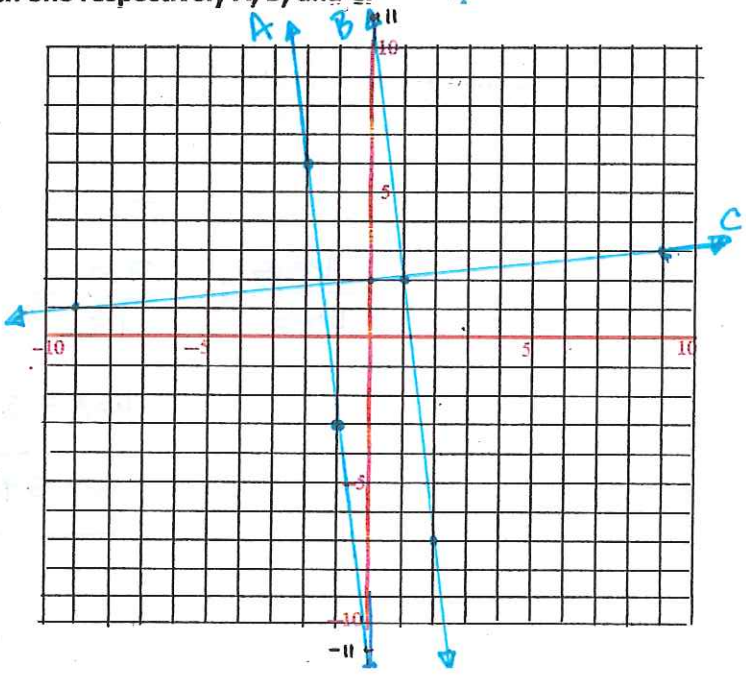
$m =$ -9, $b =$ -12

Equation from #7: $y=-9x+11$ **. Label B**

$m =$ -9, $b =$ 11

Equation from #8: $y=\frac{1}{9}x+2$ **. Label C**

$m =$ $\frac{1}{9}$, $b =$ 2



10.) **Mr. Falinski is looking to rent a motorcycle so of course he visits Mr. Lee's House of Choppers. Mr. Lee tells him if he rents a bike for 5 months it will be $475. If he rents it for 9 months it will cost $695. Set up an equation to model this situation then find out how much Mr. Falinski has paid after a year.** $(5, 475)$ $(9, 695)$

(A) **Find a linear equation for the total cost. Let *x* = the number of months and *y* = the total cost.**

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{695 - 475}{9 - 5} = \frac{220}{4} = 55$

$(5, 475)$

$y - y_1 = m(x - x_1)$

$y - 475 = 55(x - 5)$

$y - 475 = 55x - 275$

$\boxed{y = 55x + 200}$

or

$y = mx + b$

$475 = 55(5) + b$

$475 = 275 + b$

$200 = b$

$\boxed{y = 55x + 200}$

(B) **Using a complete sentence, explain what the slope means in terms of the content.**

$m = 55$: \$55 For 1 MONTH

(C) **How much will the total cost be if he rents the bike for 1 ½ years?**

$y = 55x + 200$

$x = 1\frac{1}{2}$ YEARS $= 18$ MONTHS

$y = 55(18) + 200$

$y = 990 + 200$

$\boxed{y = \$1190}$

(D) **How many months will he have the motorcycle if the total cost is $1,300.**

$y = 55x + 200$

$y = 1300$

$1300 = 55x + 200$

$1100 = 55x$

$\boxed{20 \text{ MONTHS} = x}$

(E) **Write a linear equation that is parallel to your linear equation in (A) where a customer rents for 4 months at a total cost of $720.**

$\parallel$ $m = 55$

$(4, 720)$

$y - y_1 = m(x - x_1)$

$y - 720 = 55(x - 4)$

$y - 720 = 55x - 220$

$\boxed{y = 55x + 500}$

or

$y = mx + b$

$720 = 55(4) + b$

$720 = 220 + b$

$500 = b$

$\boxed{y = 55x + 500}$

(F) **Write a linear equation that is perpendicular to your linear equation in (A) where a customer rents for 55 months at a monthly cost of $5000.**

$\perp$ $m = -\frac{1}{55}$

$(55, 5000)$

$y - y_1 = m(x - x_1)$

$y - 5000 = -\frac{1}{55}(x - 55)$

$y - 5000 = -\frac{1}{55}x + 1$

$\boxed{y = -\frac{1}{55}x + 5001}$

or

$y = mx + b$

$5000 = -\frac{1}{55}(55) + b$

$5000 = -1 + b$

$5001 = b$

$\boxed{y = -\frac{1}{55}x + 5001}$