Warm Up

Given 5x - 3y = 15,

a) Write in slope intercept form.

$5x - 3y = 15$

$-5x \qquad -5x$

$-3y = -5x + 15$

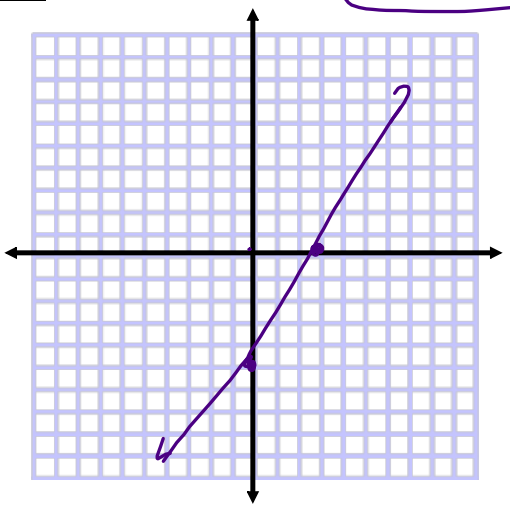
$\frac{-3y}{-3} = \frac{-5x}{-3} + \frac{15}{-3}$

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

$-\frac{3}{5}$

b) m = $5/3$ b = -5

c) Graph



Quiz

Creating Linear Equations in Two Variables $y = mx + b$

1. A cab company charges a $3 boarding rate in addition to its meter which is $2 for every mile. $y = 2x + 3$

2. The restaurant is having a special tonight in which you can get a drink for $2.50 and then purchase some wings for $.30 each. $y = .30x + 2.50$

3. A gear on a machine turns at a rate of 2 revolutions per second. $y = 2x$

4. The carpenter is going to build this new house for Habitat for Humanity. The carpenter quoted a price of $125,000 for the supplies and then for a discounted price, his hourly rate would be $5 per hour. $y = 5x + 125{,}000$

5. A cab company charges an initial rate of $2.50 for a ride, plus $0.40 for each mile driven. $y = .40x + 2.50$

6. Matthew receives a base weekly salary of $300 plus a commission of $50 for each vacuum he sells.

7. A water company charges a monthly fee of $6.70 plus a usage fee of $2.60 per 1,000 gallons used. $y = 2.60x + 6.70$

8. Maddie borrowed $1,250 from a friend to buy a new TV. Her friend doesn't charge any interest, and Maddie makes $40 payments each month. $y = 40x + 1250$

9. You and some friends are hiking the Appalachian Trail. You started out with 70 pounds of food for the group, and eat about 8 pounds each day. $y = 8x + 70$

11. The trash company is charging $17 per month and $25 trash can rental fee. $y = 17x + 25$

12. Juan paid $20 per pants and a shirt for $25. $y = 20x + 25$

13. Mr. Kotter's Rentals rent a Cadillac Escalade for $99 for one week plus $0.11 per mile. $y = .11x + 99$

14. We went looking at different cell phone packages. Package A has a base rate of $39.95 and will cost 0.12 per minute. $y = .12x + 39.95$

15. Kim and Cyndi are starting a business tutoring students in math. They rent an office for $400 per month and charge $40 per hour per student. $400x + 40y$

Applications of Standard to Slope-Intercept Form $Ax + By = C$

1. Jennifer is a college student who works two jobs after school and on weekends trying to make some extra spending money and to help pay for her tuition. At Job X, she gets \$8 an hour, and at job Y, she gets \$10 an hour. If Jennifer works at both Job X and Job Y during the week. Jennifer wants to make \$100 combined for working her two jobs.

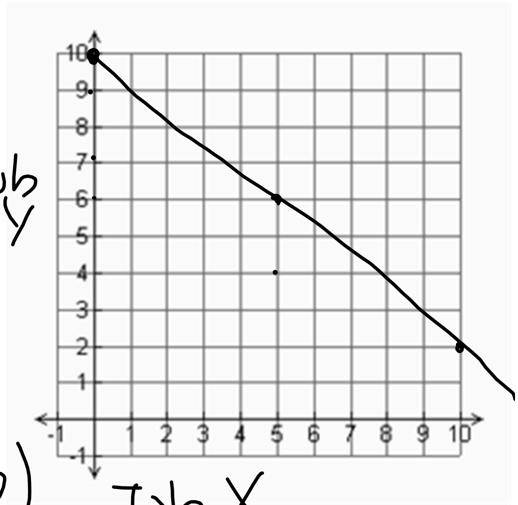
a. Write an equation to represent this situation.

$8x + 10y = 100$

b. Rewrite your equation in slope-intercept form.

$8x + 10y = 100$
$-8x \quad\quad -8x$
$\frac{10y}{10} = \frac{-8x}{10} + \frac{100}{10}$
$y = -\frac{4}{5}x + 10$

c. Graph.



d. Find three different combinations of hours worked at each job that will allow Jennifer to earn \$100.

(0, 10), (5, 6), (10, 2)

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2. You oversee buying the hamburger and chicken for a party. You have \$30 to spend. The hamburger costs \$2 per pound and chicken is \$3 per pound.

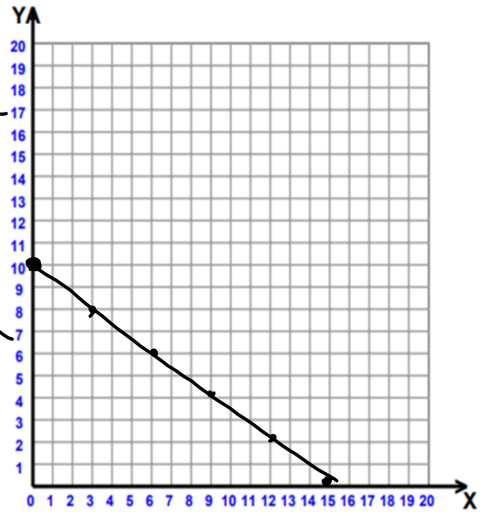
a. Write an equation that represents the different amounts of hamburger, *x*, and chicken, *y*, that you can buy.

$2x + 3y = 30$

b. Rewrite the equation into slope-intercept form.

$2x + 3y = 30$
$-2x \quad\quad -2x$
$\frac{3y}{3} = \frac{-2x}{3} + \frac{30}{3}$
$y = -\frac{2}{3}x + 10$

c. Then graph.



d. If you buy 3 pounds of hamburger, how many pounds of chicken can you buy?

8 pounds of chicken

e. List three different combinations of hamburgers and chick[en] you can buy.

(0, 10), (3, 8), (6, 6)
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3. You are buying ~~$36~~ $48 worth of lawn seed that consists of two types of seed. One type is a quick-growing rye grass that costs $4 per pound, and the other type is a higher-quality seed that costs $6 per pound.

total: 48 x = Rye Seed $4 y = higher quality $6

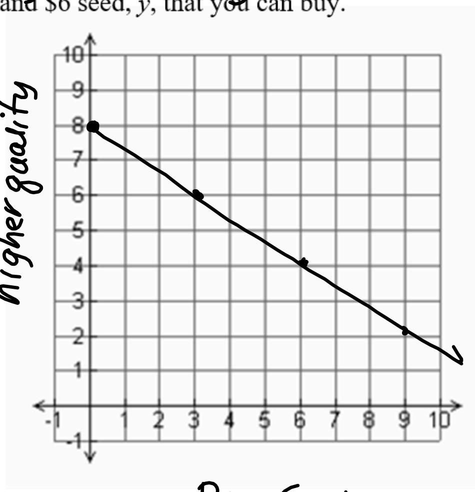
a. Write an equation that represents the different amounts of $4 seed, x, and $6 seed, y, that you can buy.

$4x + 6y = 48$

b. Rewrite the equation into slope-intercept form.

$4x + 6y = 48$
$-4x \quad -4x$
$\frac{6y}{6} = \frac{-4x}{6} + \frac{48}{6}$ $y = -\frac{2}{3}x + 8$

c. Graph the function.



d. If you buy 3 pounds of $4 seed, how many pounds $6 seed can you buy? 6 pounds of $6 seed

e. List three different combinations of seed combinations.

(0,8), (3,6), (6,4), (9,2)

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4. You are buying $30 worth of birdseed that consists of two types of seed. Thistle seed attracts finches and costs $2 per pound. Dark oil sunflower seed attracts many kinds of sunbirds and costs $3 per pound.

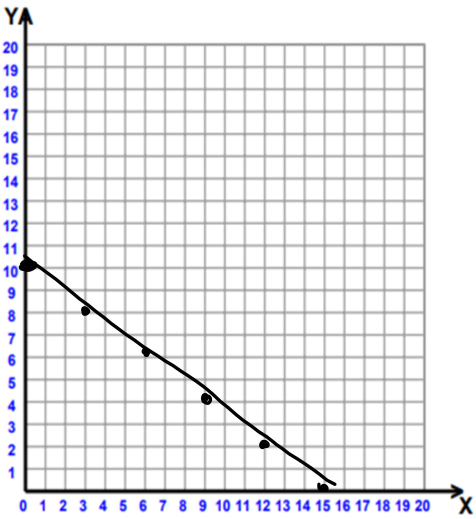
Total: $30 x = thistle $2 y = dark oil $3

a. Write an equation that represents the different amounts of $2 thistle seed, x, and $3 dark oil sunflower seed, y, that you could buy. $2x + 3y = 30$

b. Rewrite the equation in slope-intercept form.

$2x + 3y = 30$
$-2x \quad -2x$
$\frac{3y}{3} = \frac{-2x}{3} + \frac{30}{3}$
$y = \frac{-2}{3}x + 10$

c. Graph.



d. If you buy 5 pounds of the dark oil seeds, how many pounds of thistle seed can you buy? 8 pounds

e. List three possible combinations of seed mixtures.

(0,10), (3,8) (6,6), (9,4), (12,2)
(15,0)
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