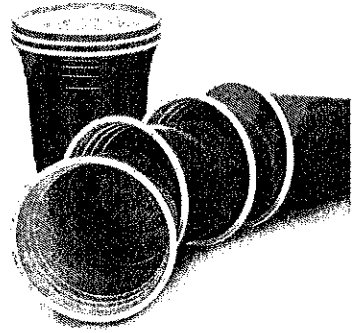


Day 33: REVIEW

Algebra Party!!!

The algebra teachers are having a party! They're trying to determine the height of Mr. Maurer by stacking cups, and they are tying knots in ropes and studying the decreasing length. They go to the store for supplies and buy cups for \$5 per package (x) and rope for \$3 per meter (y). They spend a total of \$30.



1. Which form would be best to represent this situation? Circle one and explain.

Slope-Intercept Form Standard Form Point-Slope Form

2 things combine to make a total.

2. Write an equation to represent the situation:

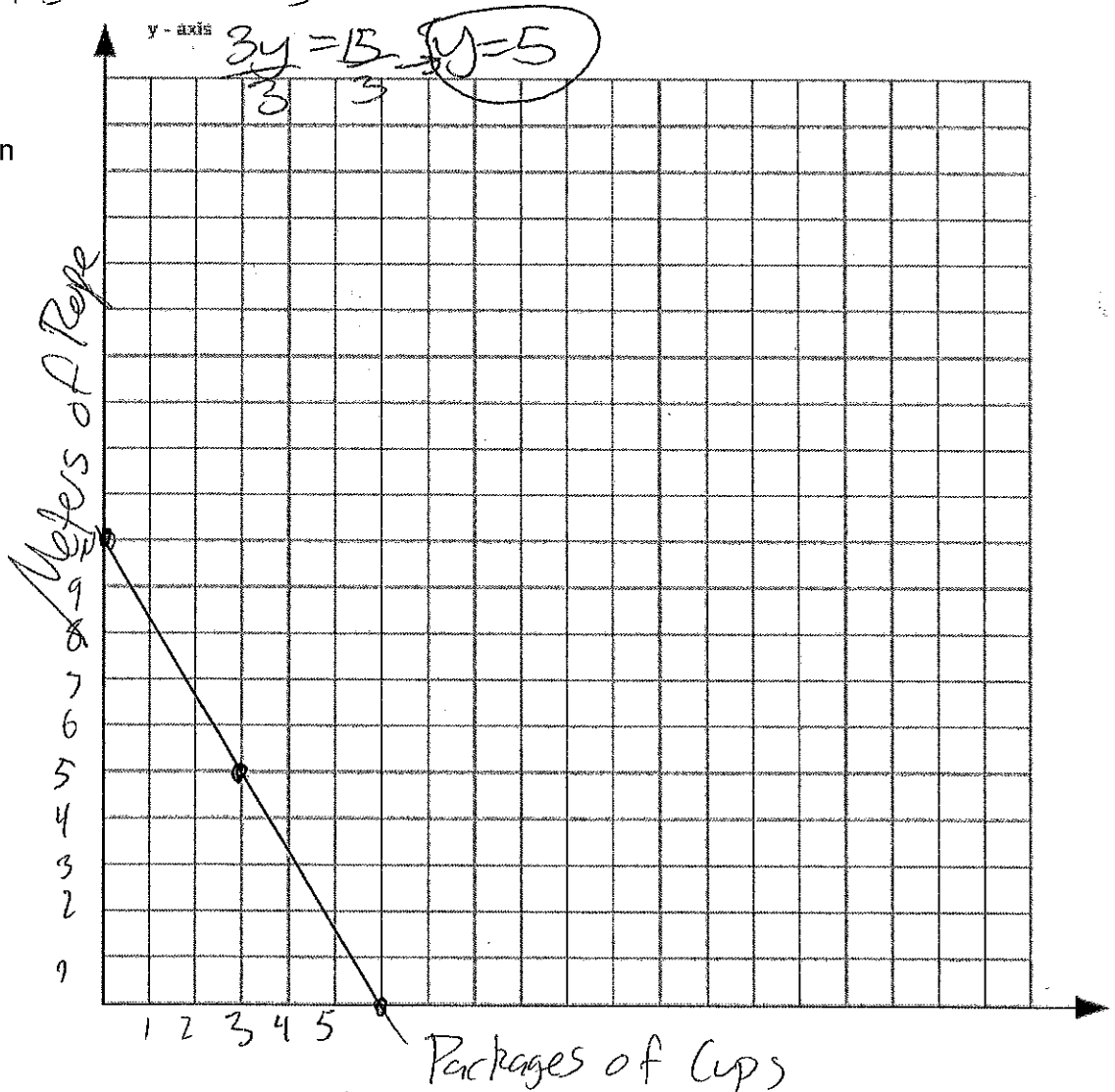
$$5x + 3y = 30$$

3. If they purchased 3 packages of cups, how many meters of rope did they purchase? Find your answer algebraically.

$$\begin{aligned} 5(3) + 3y &= 30 \\ 15 + 3y &= 30 \\ -15 \quad -15 & \end{aligned}$$

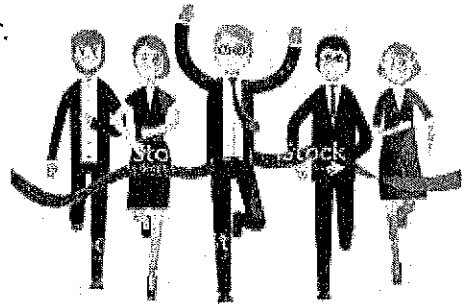
4. Graph the equation here →

$$\begin{aligned} 5x + 3y &= 30 \\ -5x \quad -5x & \\ \hline 3y &= -5x + 30 \\ \div 3 & \\ y &= -\frac{5}{3}x + 10 \end{aligned}$$



The Big Race (revisited)

Mr. Ward is still mad that the other algebra teachers left him out of the first three preliminary heats in The Big Race. He challenges the algebra teachers to another race. Use the following information to write an equation for each runner. Then, determine who wins the race.



- I(x). Ian Maurer can run 21 yards every 3 seconds. He is feeling pretty overconfident, so he waits for 3 seconds before he starts running from the starting line.
- E(x). Ellen Maiden can run 16 yards every 4 seconds. She was the winner in the last big race so she takes off at the starting gun from the starting line. No head starts for her.
- C(x). Chelsea Muhs can run 24 yards every 4 seconds. She is pretty heated about not winning many of the previous heats. She requests a 5 yard head start, and starts running at the starting gun.
- J(x). Jason Ward can run 27 yards every 3 seconds. He requests to have a 10 yard head start, but he is still arguing with Mr. Maurer about leaving him off the other activity, so he takes 3 seconds after the starting gun to start running.

1. Use the information above to write an equation for each runner.

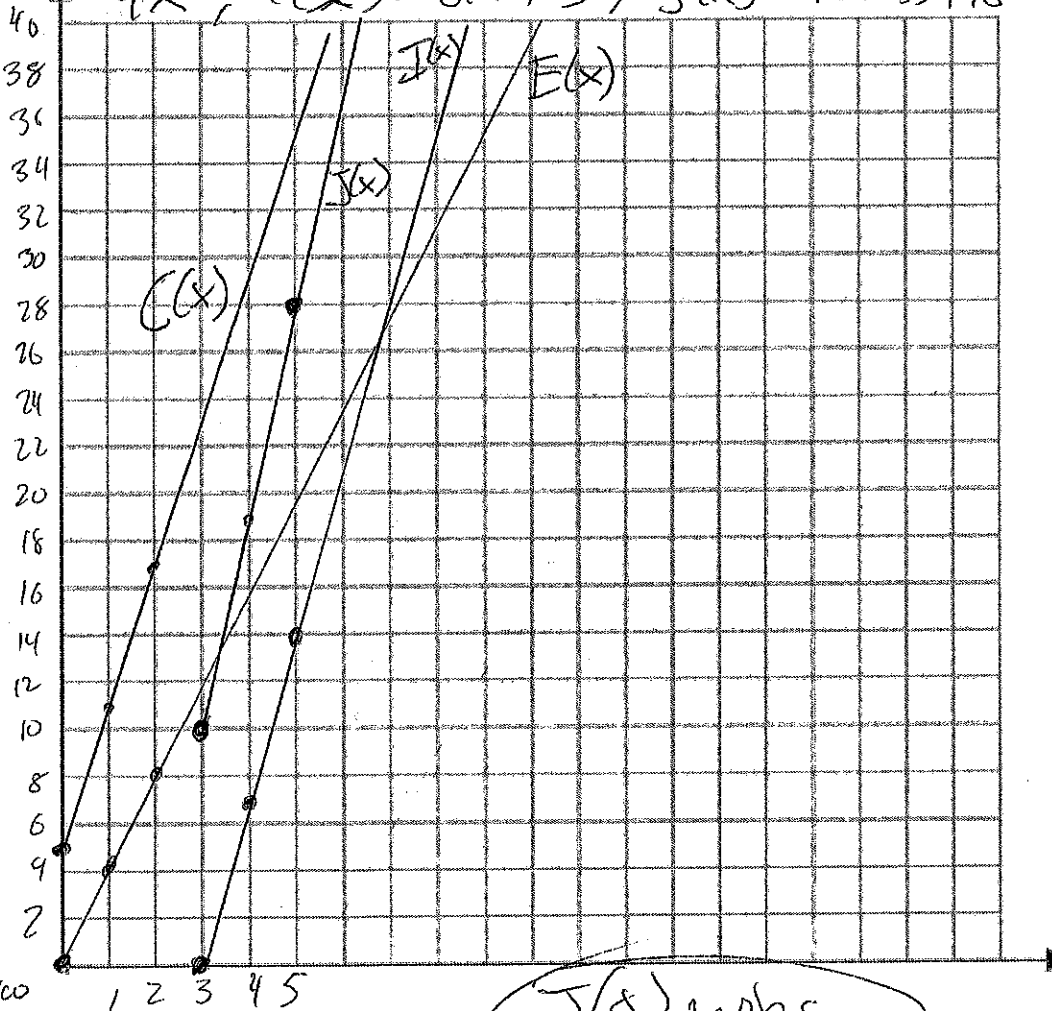
$$I(x) = \frac{21}{3}(x-3), \quad E(x) = \frac{16}{4}x, \quad C(x) = \frac{24}{4}x + 5, \quad J(x) = \frac{27}{3}(x-3) + 10$$

$$I(x) = 7(x-3), \quad E(x) = 4x, \quad C(x) = 6x + 5, \quad J(x) = 9(x-3) + 10$$

2. Graph each equation →

3. Determine who wins the race.

The race is 100 yards.
 My graph shows only the first 40 yards.
 As you can see, I(x) & J(x) pass E(x), so Ms. Maiden loses. J(x) is ahead of I(x) & has a bigger slope, so Mr. Ward beats Mr. Maurer. I can't tell if J(x) beats C(x) so I use algebra.



$$J(x) = 100 \quad \text{vs} \quad C(x) = 100$$

$$9(x-3) + 10 = 100 \quad \text{vs} \quad 6x + 5 = 100$$

$$\frac{9(x-3)}{9} = \frac{90}{9} \quad \frac{7-x-3}{7} \rightarrow x-3=10 \rightarrow x=13$$

$$\frac{6x}{6} = \frac{95}{6} \quad x = 15\frac{5}{6}$$

J(x) wins.

Extra Practice

1. Write an equation in standard form of this situation: DEFINE YOUR VARIABLES

Brandy purchases 3 apples and 4 juices for \$12.

$x = \text{price of apple}$, $y = \text{price of juice}$

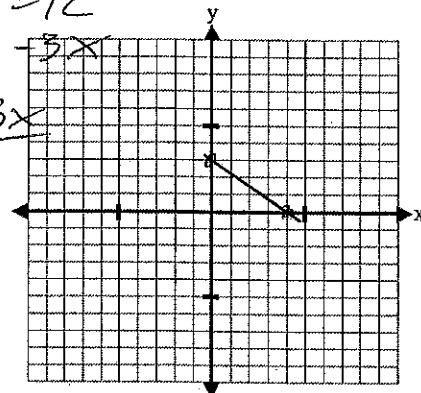
$$3x + 4y = 12$$

2. Convert the equation in **problem 1** to slope-intercept form and graph it.

$$3x + 4y = 12$$

$$\begin{array}{r} -3x \\ 4y = 12 - 3x \\ \hline y = 3 - \frac{3}{4}x \end{array}$$

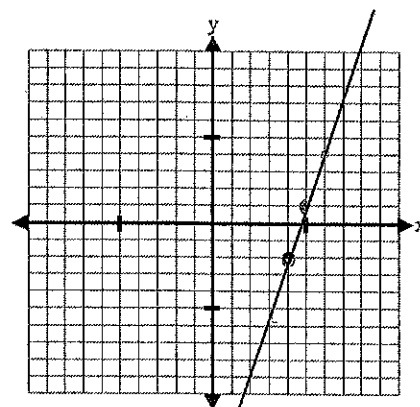
$$y = 3 - \frac{3}{4}x$$



3. Write an equation in point-slope form of the line that has a slope of 3 and passes through the point (4, -2)

$$y = 3(x - 4) - 2$$

4. Graph the equation in **problem 3**.



For $f(x) = -5x + 4$...

a. Find $f(3)$

$$\begin{array}{r} f(3) = -5(3) + 4 \\ -15 + 4 \end{array}$$

$$f(3) = -11$$

b. Solve $f(x) = -26$

$$\begin{array}{r} -26 = -5x + 4 \\ -4 \quad -4 \end{array}$$

$$\begin{array}{r} -30 = -5x \\ \hline -5 \quad -5 \end{array}$$

$$6 = x$$

For $g(x) = 4(x - 3)$

a. Find $g(3)$

$$\begin{array}{r} g(3) = 4(3 - 3) \\ = 4(0) \end{array}$$

$$g(3) = 0$$

b. Solve $g(x) = -24$

$$\begin{array}{r} -24 = 4(x - 3) \\ \hline 4 \quad 4 \end{array}$$

$$-6 = x - 3$$

$$\begin{array}{r} +3 \quad +3 \end{array}$$

$$-3 = x$$

1. Write an equation in standard form of this situation: DEFINE YOUR VARIABLES

Kameron buys tacos and burritos from the taco truck on Powell. Tacos cost \$2.75 and burritos cost \$5.50. Kameron spends \$19.25

$x = \# \text{ of tacos}, y = \# \text{ of burritos}$

$$2.75x + 5.50y = 19.25$$

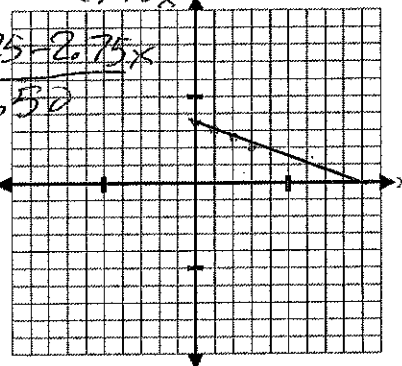
2. Convert the equation in problem 1 to slope-intercept form and graph it.

$$2.75x + 5.50y = 19.25$$

$$-2.75x$$

$$\frac{5.50y}{5.50} = \frac{19.25 - 2.75x}{5.50}$$

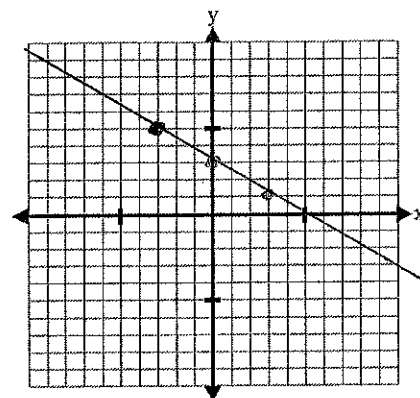
$$y = 3.5 - .5x$$



3. Write an equation in point-slope form of the line that has a slope of $-\frac{2}{3}$ and passes through the point $(-3, 5)$

$$y = -\frac{2}{3}(x + 3) + 5$$

4. Graph the equation in problem 3.



For $f(x) = -2(x - 4) + 3 - x \dots$

c. Find $f(3)$

$$f(3) = -2(3 - 4) + 3 - 3$$

$$= -2(-1) + 0$$

$$f(3) = 2$$

d. Solve $f(x) = -26$

$$-26 = -2(x - 4) + 3 - x$$

$$-26 = -2x + 8 + 3 - x$$

$$-26 = -3x + 11$$

$$-11 \quad -11$$

$$\frac{-37}{-3} = \frac{-3x}{-3} \rightarrow x = \frac{37}{3}$$

For $g(x) = 3(x + 5) - 5(x + 3)$

c. Find $g(3)$

$$g(3) = 3(3 + 5) - 5(3 + 3)$$

$$3(8) - 5(6)$$

$$24 - 30 = -6$$

$$g(3) = -6$$

d. Solve $g(x) = -24$

$$-24 = 3(x + 5) - 5(x + 3)$$

$$-24 = 3x + 15 - 5x - 15$$

$$-24 = -2x$$

$$\frac{-24}{-2} = \frac{-2x}{-2}$$

$$12 = x$$