

Warm-Up-

1. You have \$150 to spend on new clothes. You go to a store where all shirts are on sale for \$15 and all pants are \$25. Write an equation that will give you the different combinations of shirts and pants you could buy.

$$15x + 25y = 150$$

2. You start working on a puzzle that has 1000. Each hour you are able to connect 100 pieces. Write an equation that will tell you how many pieces you have left given how many hours have passed.

$$y = 1000 - 100x$$

$$y = -100x + 1000$$

3. You are given \$500 for a graduation gift and start saving \$50 a month. Write an equation that will calculate how much money you have in your savings given how many months have passed.

$$y = 500 + 50x$$

$$y = 50x + 500$$

4. You are buying movie tickets for kids and adults. If there are 6 kids and 12 adults with you, and the total cost was \$129, write an equation that represents the different possible cost for a kid ticket and an adult ticket.

$$6x + 12y = 129$$

Slope-intercept form What if you don't know m ?

- Plug in b into $y = \underline{b} + mx$
- Plug the example of $x \rightarrow y$ into $\underline{y} = b + mx$
- Solve for m

Slope-intercept form What if you don't know b ?

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- Plug in the example for $x \rightarrow y$ into $\underline{y} = b + mx$
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Ex 1: Jason is has saved \$25,000 for a rainy day. He loses his job and now needs to live off of his savings. After 4 months he has \$20,000 left. Write an equation that can be used to calculate how much money he will have in savings depending on how many months it has been since he lost his job.

$$y = 25000 + mx$$

$$20000 = 25000 + m(4)$$

$$\begin{array}{r} -25000 \\ -25000 \end{array}$$

$$-5000 = m(4)$$

$$\frac{-5000}{4} = \frac{m(4)}{4}$$

$$-1250 = m$$

How long could Jason live off of his savings? $y = 25000 - 1250x$

Ex 2: Karen is finishing a quilt that her grandmother started. She starts working on it and adds 3 squares a day. After 5 days it has 21 squares. Write an equation that would calculate how many squares it has depending on how many days she has been working.

$$y = b + 3x$$

$$21 = b + 3(5)$$

$$21 = b + 15$$

$$\begin{array}{r} -15 \\ -15 \end{array}$$

$$b = b$$

$$y = b + 3x$$

Ex 3: Elena really likes German chocolate cake. Her grandma makes a cake and cuts it into 30 pieces. Elena eats the same amount each day. After 4 days, there are 18 pieces left.

Write an equation that would calculate how many pieces Elena has left depending on how long it has been since her grandma gave her the cake.

$$y = 30 + mx$$

$$\begin{array}{r} 18 \\ -30 \\ \hline -12 \end{array} = \begin{array}{r} 30 + m(4) \\ -30 \\ \hline m(4) \end{array}$$

$$\frac{-12}{4} = \frac{m(4)}{4}$$

$$-3 = m$$

$y = 30 - 3x$

Ex 4: Equation from a Table

The following table lists the amount of money in a checking account at a specific number of months. Use the table to write an equation that would calculate how much money is in the account depending on how many months the account has been open.

Months	1	2	4	10	21	23
Account Balance	\$185	\$220	\$290	\$500	\$885	\$955

Practice:

1. At *The Book Rental Shop* it costs \$0.25 per book you check out and \$0.50 per movie you check out. If you have \$4.00 to spend, write an equation that will give you the different combinations of books and movies you can check out.

$$.25x + .50y = 4$$

2. You received \$200 for your birthday and start spending the same amount each month. After 3 months you have \$131 left. Write an equation that will calculate how much money you have left depending on how many months have passed.

$$y = 200 + mx$$

$$\begin{array}{r} 131 = 200 + m(3) \\ -200 \quad -200 \\ \hline -69 = m(3) \end{array}$$

$$\begin{array}{r} -69 = m(3) \\ \frac{-69}{3} = \frac{m(3)}{3} \\ -23 = m \end{array}$$

$$y = 200 - 23x$$

3. An empty tub is filling with water. Each minute the tub gains 4 gallons of water. Write an equation that would calculate how much water is in the tub given how many minutes have passed.

$$y = 0 + 4x$$

$$y = 4x$$

4. Sonya is selling lemonade for \$1 and cookies for \$0.50. If she needs to make \$20, write an equation that will give the possible combinations of lemonade and cookies that she needs to sell.

$$1x + 0.50y = 20$$

5. Jose is given money for his birthday and puts it in savings. He then adds \$75 to the savings account each month. After 2 months there is \$525 in the account. Write an equation that will calculate how much money he has based on how many months have passed.

$$y = b + 75x$$

$$\begin{array}{r} 525 = b + 75(2) \\ 525 = b + 150 \\ -150 \quad -150 \\ \hline 375 = b \end{array}$$

$$y = 375 + 75x$$