

Math 10 Chp 7.1

Note Title

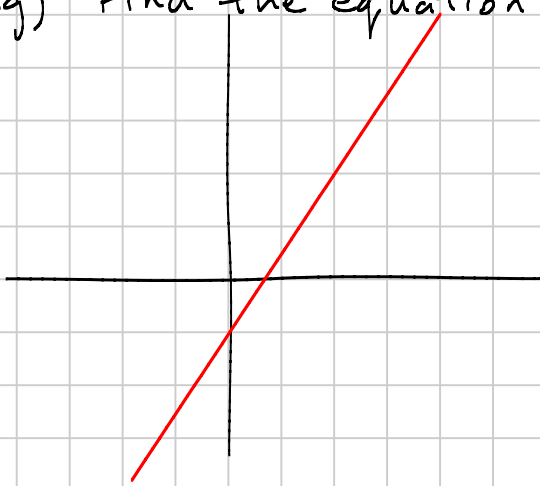
2017-01-02

Slope-Intercept Form - is a convenient form of a linear equation, but not the only form. It is very easy to graph, and we can use it to solve problems.

Recall: slope = $\frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$

Slope-intercept form: $y = mx + b$

eg) Find the equation of the line in slope-intercept form.



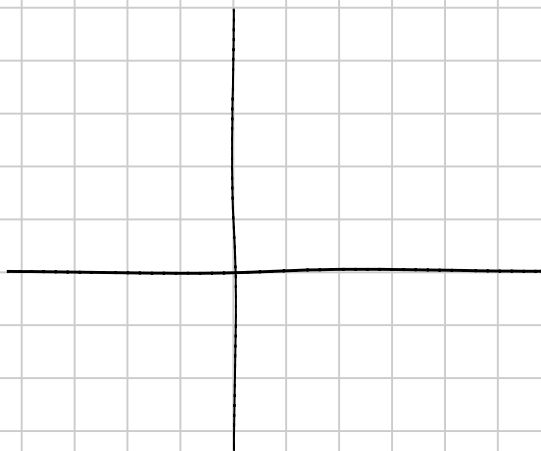
For best accuracy, look for grid points (points on grid lines).

Note: the y-intercept occurs where $x=0$. Substitute:

eg) Find the equation of the line in slope-intercept form.

x	y
1	4
2	7
3	10
4	13

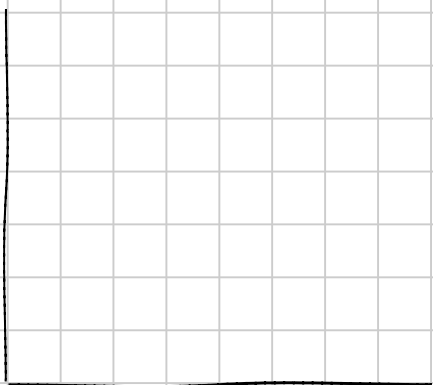
eg) Graph: $y = -\frac{2}{3}x + 2$



Start at y-int.
Do run right, then rise,
plot a point. -'ve applies
to rise.
Draw a line thru points.

eg) Find the equation of the line in slope-intercept form.
 $3x - 5y + 15 = 0$

eg) A waiter gets paid \$40 for his shift and gets tips averaging 10% of his sales.
Determine the equation. Draw a graph.
How much does he get paid if his sales is \$400?
How much does he need to sell if he wants to make \$100?



Assigned Work: pp. 349-356: 1ace, 2, 3, 5ac, 6ac, 7
8ace, 9ab, 10ab, 13
Challenge: 20-23

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2017-01-02

General Form (of a line) - $Ax + By + C = 0$

$A, B, C \in \mathbb{R}$, $A \neq 0$, A & B both not zero.

However, we generally have $A, B, C \in \mathbb{Z}$

The benefit of general form over slope-intercept form is that the x-intercept is easier to calculate.

eg) Calculate the intercepts of $3x + 4y + 5 = 0$.

eg) Convert to general form: $y = -\frac{2}{5}x + 3$

eg) Convert to general form: $y = \frac{2}{7}x + \frac{4}{7}$

eg) Create an equation with x-int = -4 & y-int = 3

eg) Create an equation with x-int = 2 & y-int = -4

eg) Suzy has a bunch of dimes and quarters that total \$2.65. Determine an equation. Determine how many quarters Suzy has if she has 9 dimes. Determine how much money in quarters if she has 14 dimes.

eg) The Vancouver Giants sell Club Seats for \$30 and End Zone Seats for \$19.50. They need \$60000 per game to break even. Determine an equation in general form. Determine how many End Zone seats are needed to break even if they sell 900 Club Seats.

Assigned Work: pp. 365-369: 2ace, 3ceg, 4, 7, 11,
13
Challenge: 12, 17, 20

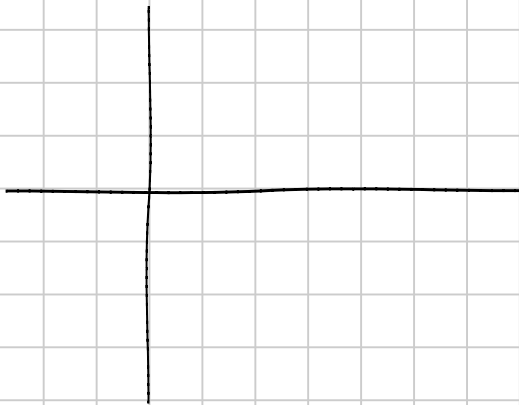
Math 10 Chp 7.3

Note Title

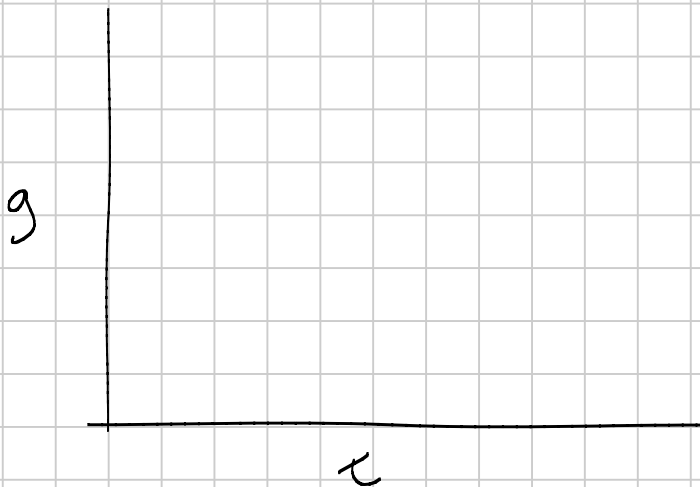
2017-01-02

Slope-Point Form: An easy to use form if you are not given the y-intercept: $y - y_1 = m(x - x_1)$

eg) What is the equation of the line going thru $(2, 3)$ and $(5, -2)$? Then graph.



eg) A car has been averaging 10 L of gas per hour for 3 hours. There is 45 L of gas remaining in the tank. Determine an equation. Draw a graph. About how long before they run out of gas? How much gas did they start with?



eg) Joe was hand-line ice fishing. He let the line out for 15 seconds but forgot to measure the depth. No problem. He let the line out for another 10 seconds to get to the end of his reel. His fishing line is 45 feet. Determine an equation, then determine how many seconds he needs to pull the line in to get the bottom of the line to 27 ft.

eg) A farmer has linear population growth of dairy cows. In 2005, he had 149, and in 2009, he had 165 cows. How many cows did he have in 2000 and 2016? Determine an equation first.

Assigned Work: pp. 377-382: 2ad, 3ac, 4a, 6cd

13, 14

Challenge: 17, 20, 21

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Parallel and Perpendicular Lines (\parallel and \perp)

They are interesting because they have special properties and occur frequently in our daily lives. Things would roll off tables if they aren't parallel with the floor. Pictures wouldn't hang properly if walls aren't perpendicular with the floors. And so on...

On a graph, lines are \parallel if they have the same slope.
Lines are \perp if the slopes multiply to -1 ;
or if they are negative reciprocals.

Special cases: If $m=0$, then the line is horizontal and vice-versa.

Property: \parallel lines will never meet; think of straight train tracks.

Property: \perp lines meet at 90° .

Interesting Point: Although orthogonal is a synonym of \perp , orthogonal is generally used for 3D or higher, while \perp is for 2D.

eg) Find the line \parallel with $y=3x+4$ that goes thru $(4,7)$.

eg) Find the line \parallel with $y=-2x+8$ that goes thru $(-2,-4)$; answer in slope-intercept form.

eg) Find the line \perp with $y = -\frac{1}{2}x + 7$ that goes thru $(-1, 2)$.

eg) Find the line \perp with $y = -2x + 5$ that goes thru $(2, 3)$; answer in general form.

eg) Determine if these points form a rectangle:
 $A(0, -4), B(2, 0), C(8, -2), D(6, -6)$

$$m_{AB} =$$

$$m_{BC} =$$

$$m_{CD} =$$

$$m_{DA} =$$

Assigned Work: pp. 390-395: 2, 3, 4, 5 def, 6 def, 9

Challenge: 10, 12, 16

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