

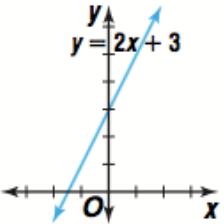
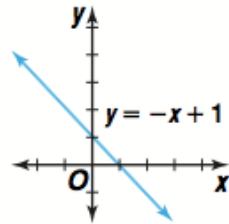
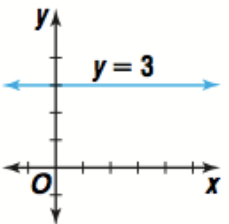
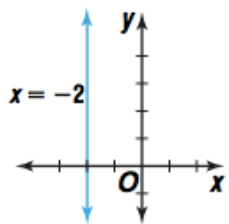
Graphing Linear Functions

1.3

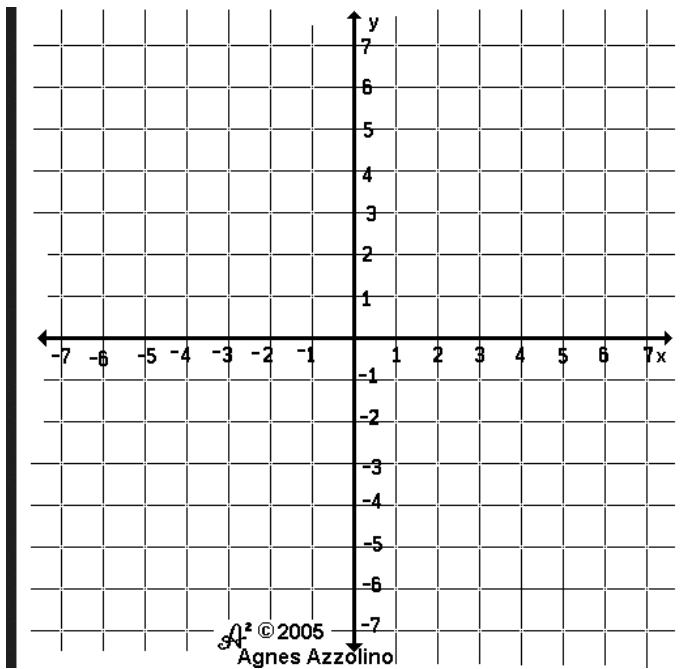
Slope Intercept Form: $y = mx + b$

Point Slope Form: $(y_2 - y_1) = m(x_2 - x_1)$

Standard Form: $Ax + By = C$

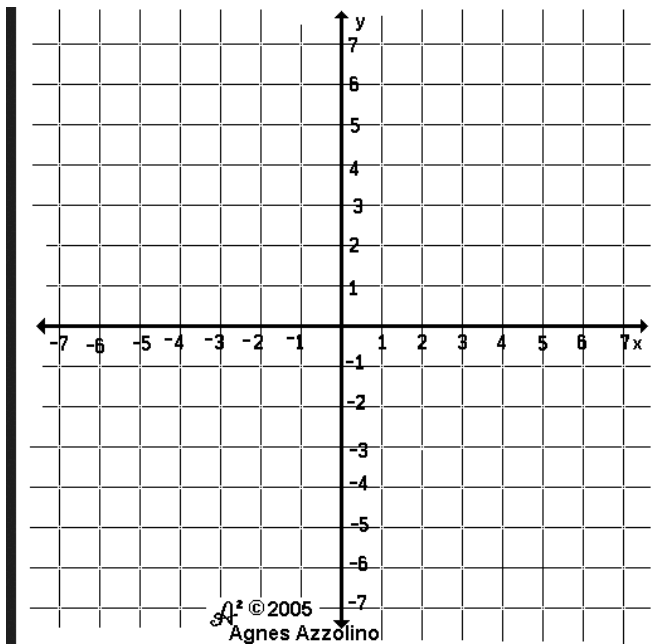
Types of Slope			
positive slope	negative slope	0 slope	undefined slope
 <p>A coordinate plane showing a line with a positive slope. The equation $y = 2x + 3$ is written above the line. The origin is labeled 'O'.</p>	 <p>A coordinate plane showing a line with a negative slope. The equation $y = -x + 1$ is written above the line. The origin is labeled 'O'.</p>	 <p>A coordinate plane showing a horizontal line with a slope of 0. The equation $y = 3$ is written above the line. The origin is labeled 'O'.</p>	 <p>A coordinate plane showing a vertical line with an undefined slope. The equation $x = -2$ is written to the left of the line. The origin is labeled 'O'.</p>

$$\text{Graph } y = 2x + 1$$



1) Identify the y intercept
2) Use the slope to graph another point.
3) Connect the points and extend the line.

Graph $-2y + 4x = 6$



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|--|
| 1) Rearrange the equation into $y=mx+b$ |
| 2) Identify the y intercept |
| 3) Use the slope to graph another point. |
| 4) Connect the points and extend the line. |

Writing Linear Functions

1.4

The y-intercept is where the line crosses the y-axis

The x-intercept is where the line crosses the x-axis

To find the x intercept, set $y = 0$

To find the y intercept, set $x = 0$

Given $2x + 3y = 12$

Find the x and y intercepts.

X-intercept

Set y to 0	$2x + 3(0) = 12$
Solve for x	$2x = 12$ $x = 6$ $(6, 0)$

Y-intercept

Set x to 0	$2(0) + 3y = 12$
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Solve for y	$2(0)+3y=12$ $3y=12$ $y=4$ $(0,4)$

We Try:

Find the x and y intercept of $-3x - 6y = 36$

X intercept:

Y intercept:

Find the equation of the line given point $(1,2)$, and slope 3.

1) Plug point and slope into $y = mx + b$	Point = (1,2) Slope (m) = 3 $2 = 3(1) + b$
2) Solve for b.	$2 = 3 + b$ $-1 = b$
3) Plug slope (m) and b into $y = mx + b$	$y = 3x - 1$

You Try:

Find the equation of the line given point (0,-2), and slope -1.

1) Plug point and slope into $y = mx + b$	
2) Solve for b.	
3) Plug slope (m) and b into $y = mx + b$	

I Try:

Find the equation of the line that has points (-1,2), and (4,7)

1) Find the slope (m) using $\frac{y_2 - y_1}{x_2 - x_1}$ $(-1, 2)$ $(4, 7)$ (x_1, y_1) (x_2, y_2)	$\frac{7 - 2}{4 - (-1)}$ $\frac{5}{5} = 1$ Slope = 1
2) Plug the slope and a point into $y = mx + b$	Point: (-1, 2) Slope (m): 1 $2 = 1(-1) + b$
3) Solve for b.	$2 = -1 + b$ $3 = b$
Plug Slope (m) and b into $y = mx + b$	$Y = 1x + 3$ $Y = x + 3$

Find the equation of a line given point (1,2) and x-intercept = 5

1) Find the x-intercept	x-intercept = 5 (5,0)
2) Find the slope (m) using $\frac{y_2 - y_1}{x_2 - x_1}$ (1,2) (5,0) (x ₁ , y ₁) (x ₂ , y ₂)	$\frac{(5-2)}{(0-1)} = \frac{3}{-1} = -3 = m$
2) Plug the slope and a point into y=mx+b	Point: (1,2) Slope (m): -3 $2 = -3(1) + b$
3) Solve for b.	$2 = -3 + b$ $5 = b$
Plug Slope (m) and b into y=mx+b	$y = 1x + 5$ $y = x + 5$

We Try:

Find the equation of the line that has points (2,0), and has y-intercept=6

1) Find the x-intercept	x-intercept = 5 (5,0)
2) Find the slope (m) using $\frac{y_2 - y_1}{x_2 - x_1}$ (1,2) (5,0) (x ₁ , y ₁) (x ₂ , y ₂)	$\frac{(5-2)}{(0-1)} = \frac{3}{-1} = -3 = m$
2) Plug the slope and a point into y=mx+b	Point: (1,2) Slope (m): -3 $2 = -3(1) + b$
3) Solve for b.	$2 = -3 + b$ $5 = b$
Plug Slope (m) and b into y=mx+b	$y = 1x + 5$ $y = x + 5$

Closure:

Discuss with your partner.

1) What does it mean if the line has no slope and passes through (5,1)?

2) What does it mean if the line is described as the x-axis?

3) How do you find a line given the x-intercept = -2 and y-intercept = 4?