Solving Systems of Equations

- helps us to find a point of intersection, e.g. when two things happen at the same time

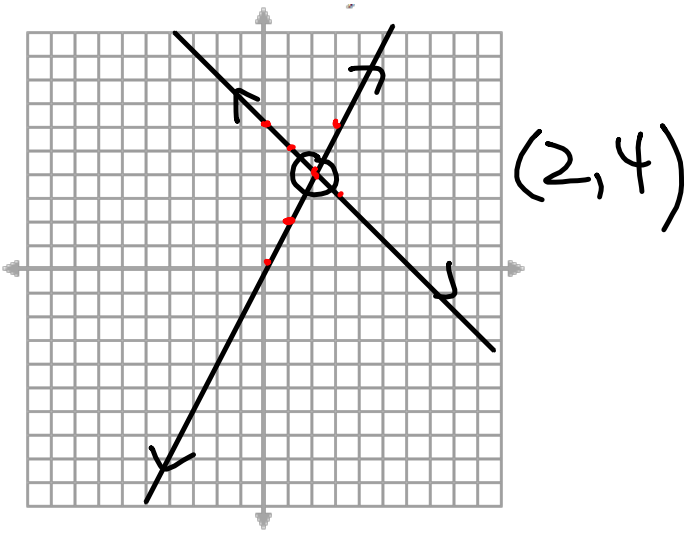
Graphing

$y = 2x + 0$ $\frac{2}{1}$

$y = -x + 6$ $\frac{-1}{1}$

3 ways to graph:

- table of values
- zeros
- rise/run

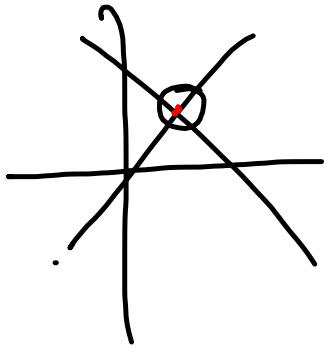


Comparison

Solve by comparing algebraic expressions using $y_1 = y_2$

1 $y_1 = 2x$

$y_2 = -x + 6$



$2x = (-x) + 6$

$3x = 6$

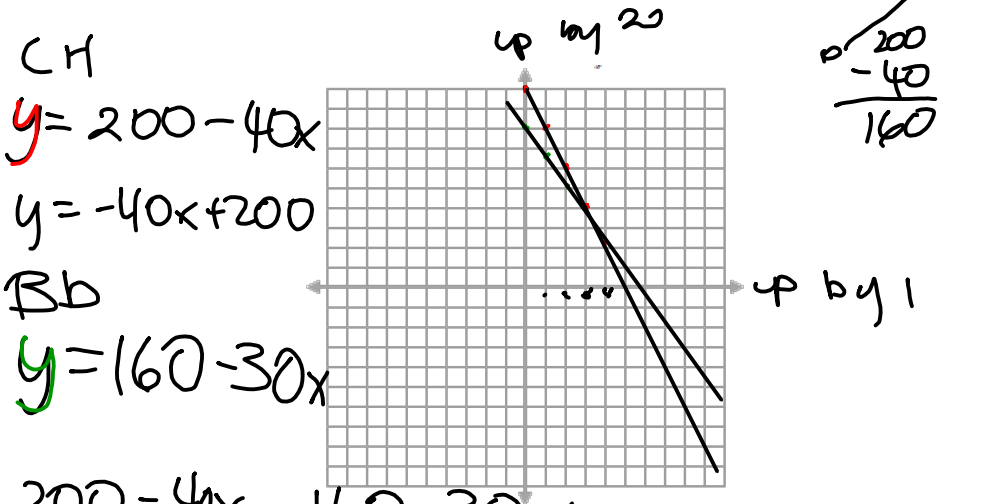
$x = 2$

$y = 2(2)$

$y = 4$

Try it out...

Two pirate ships are racing to an island to find hidden treasure. Captain Hook's ship is travelling at 40 knots (nautical miles) per hour from the north east. He is 200 nautical miles from the island. Blackbeard is travelling at 30 knots per hour from the same direction, but is only 160 nautical miles away. Will Captain Hook catch up? And if so, how far from the island will he be? Answer by graphing, and by comparison.



CH

$y = 200 - 40x$

$y = -40x + 200$

BB

$y = 160 - 30x$

$200 - 40x = 160 - 30x$

$200 - 160 = -30x + 40x$

$40 = 10x$

$4 = x$

hours

$y = 160 - 30(4)$

$y = 40$

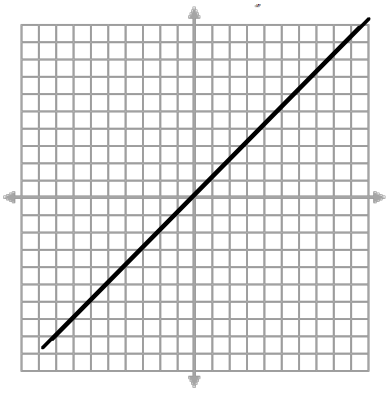
$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Can we solve a system involving parallel lines?

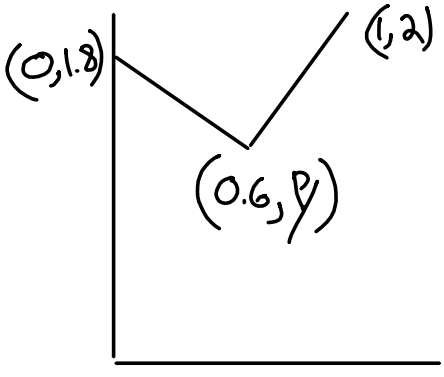
No.

$y = 5x + 3$

$y = 5x - 4$



$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$



$$\sqrt{(y-1.8)^2 + (0.6-0)^2} = \sqrt{(2-y)^2 + (1-0.6)^2}$$

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