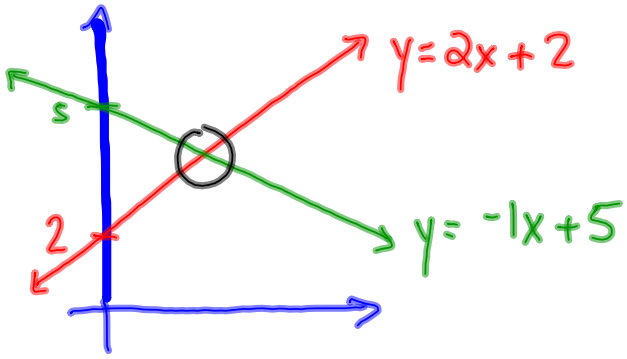
Systems of linear equations.

A.K.A. Points of intersection

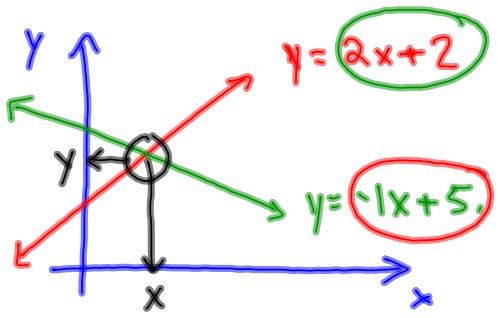
OR

where lines cross...



- Where do these two lines meet (coordinates)?
- I.e. What are the coordinates (x,y) of the point that fits perfectly into both the rule for line 1 and line 2.?

At the INTERSECTION POINT BETWEEN THE TWO LINES,



THE Y-VALUE IS THE SAME FOR BOTH LINES.

IF THE Y-VALUE IS THE SAME FOR BOTH LINES, THEN

$2x+2$ must $= -1x+5$

$$2x+2 = -1x+5$$
$$+1x \qquad +1x$$
$$3x+2 = 5$$
$$-2 \qquad -2$$
$$\frac{3x}{3} = \frac{3}{3}$$

$$\boxed{x = 1}$$

THE TWO LINES MEET WHEN $x=1$.

WHAT ABOUT THE Y-COORDINATE?

GO BACK TO EITHER OF THE FORMULAS YOU USED TO FIND 'X'; BUT PLUG IN THE X-COORDINATE YOU JUST FOUND. $(x=1)$.

$y = 2x + 2$

$y = 2(1) + 2$

$y = 2 + 2$

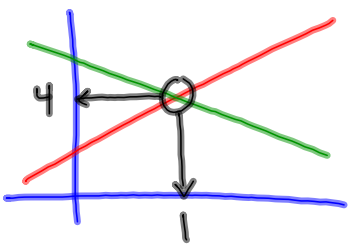
$\boxed{y = 4}$

$y = -1x + 5$

$y = -1(1) + 5$

$y = -1 + 5$

$\boxed{y = 4}$



FINAL ANSWER: THE COORDINATES OF THE POINT OF INTERSECTION BETWEEN $y = 2x + 2$ AND $y = -1x + 5$ ARE $(1, 4)$

STEPS FOR FINDING INTERSECTION POINT.

(1) MAKE EQN'S LOOK LIKE $y = ax + b$

(2) MAKE EQN'S $=$ TO EACH OTHER.

(3) SOLVE FOR 'x'

(4) USE ONE OF ORIGINAL 2 EQUATIONS AND PLUG-IN THE 'x'-VALUE TO FIND 'y'.

Ex: $10y - 15x - 40 = 0$ and $7y = -14x - 70$ } WHERE DO THESE MEET?

$10y - 15x - 40 = 0$

$+15x \quad +40 \quad = +15x + 40$

$\frac{10y}{10} = \frac{15x + 40}{10}$

$y = 1.5x + 4$

$\frac{7y}{7} = \frac{-14x - 70}{7}$

$y = -2x - 10$

$1.5x + 4 = -2x - 10$

$+2x \qquad +2x$

$3.5x + 4 = -10$

$-4 \qquad -4$

$\frac{3.5x}{3.5} = \frac{-14}{3.5}$

$x = -4$

$y = -2x - 10$

$y = -2(-4) - 10$

$y = 8 - 10$

$y = -2$

FINAL ANS: $(-4, -2)$