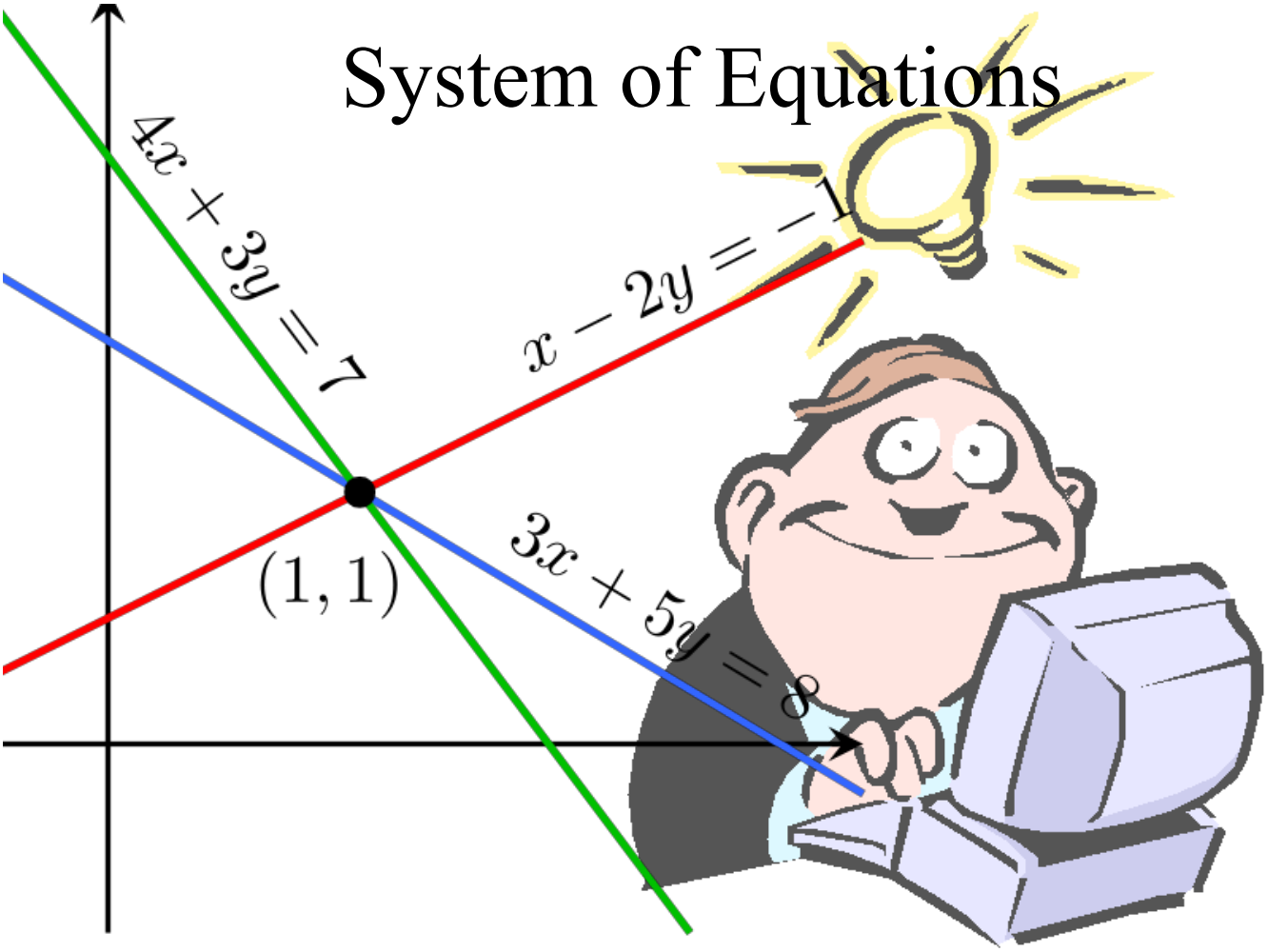
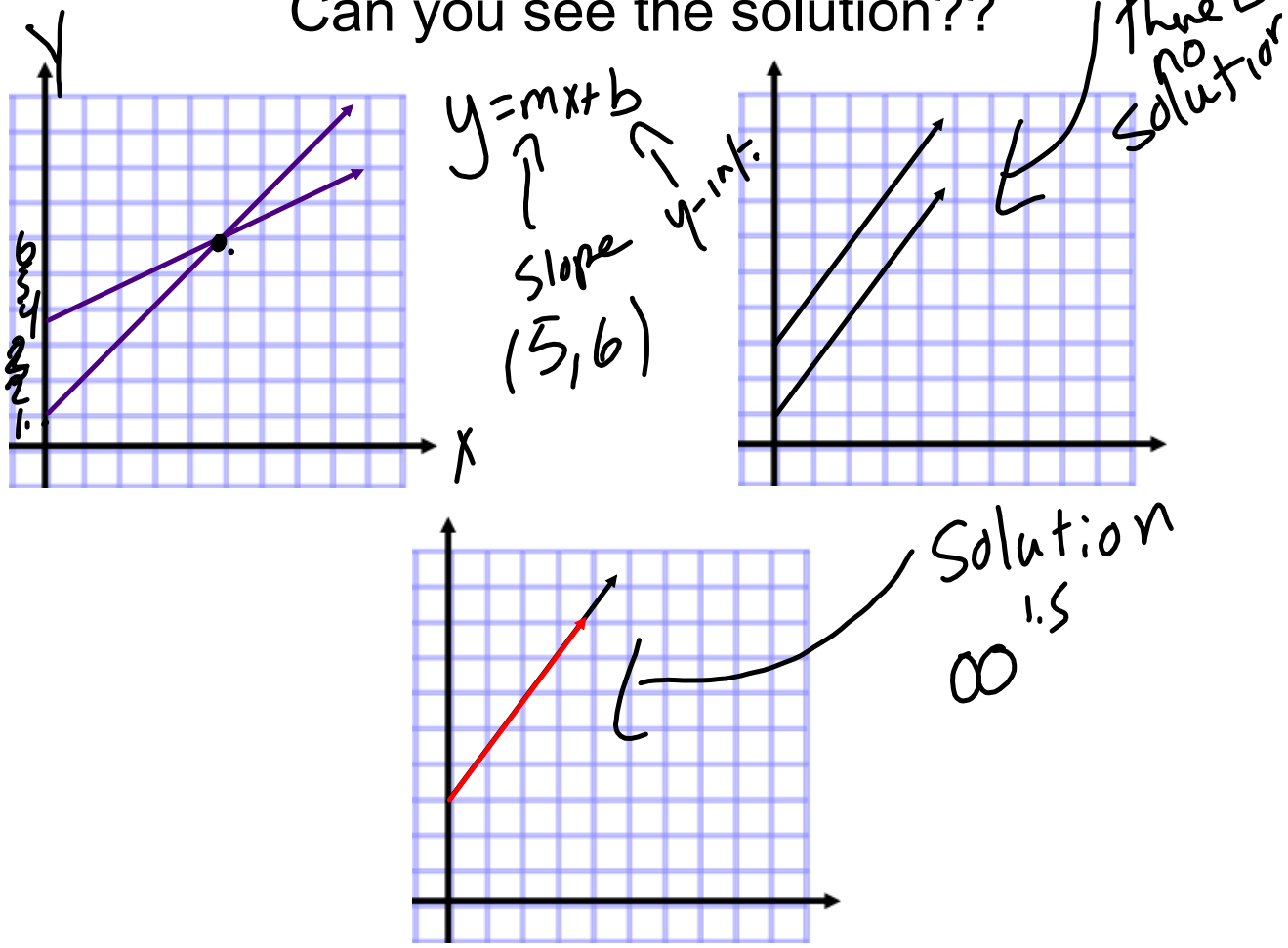
System of Equations



Can you see the solution??



Internet Service

6.

NBtel charges a monthly fee of $20.00, and an additional $2.00 per hour.
Sprint charges a monthly fee of $10.00, and an additional $4.00 per hour.

Equation??

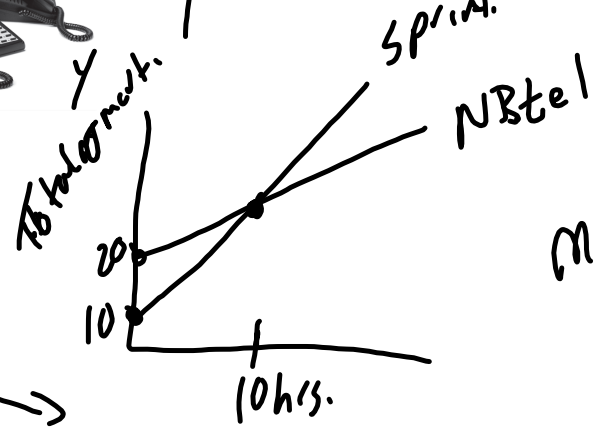
m = slope
b = y int.

20 = b
2 = 2.

NBtel $y = 2x + 20$
Sprint $y = 4x + 10$

m = 4
b = 10

$y = mx + b$



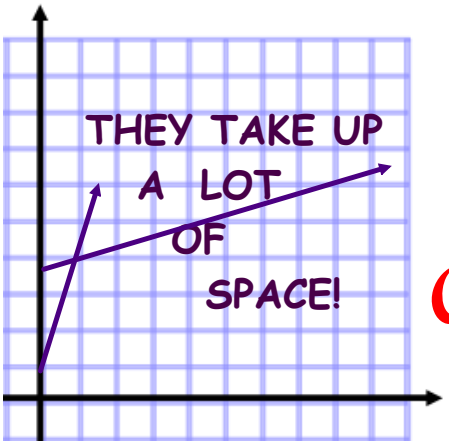
$m = \frac{rise}{run}$ $\frac{y}{x}$

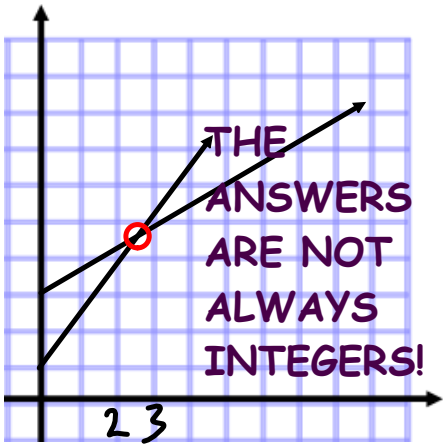
y-int.

slope = $\frac{rise}{run}$

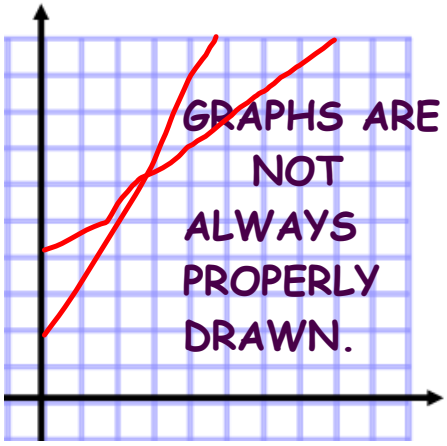
$

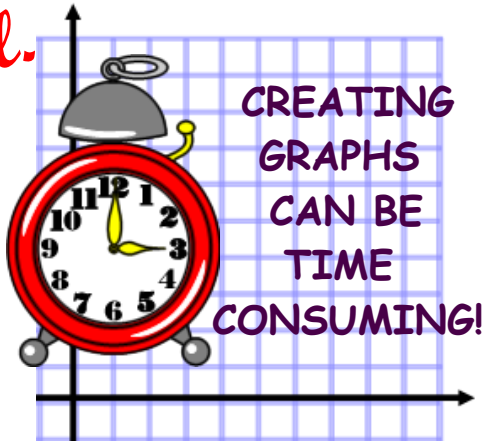
Time

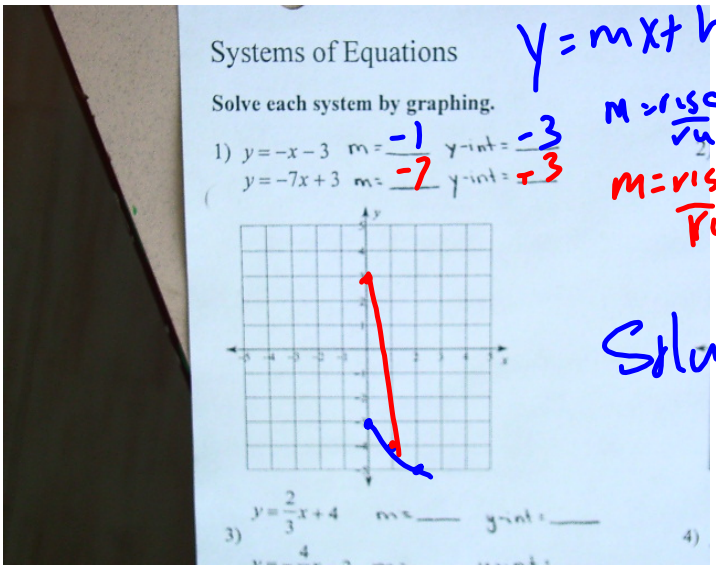




Graphing is not always practical.







$y=mx+b$

m = rise/run : $\frac{-1}{1}$ or $\frac{1}{-1}$

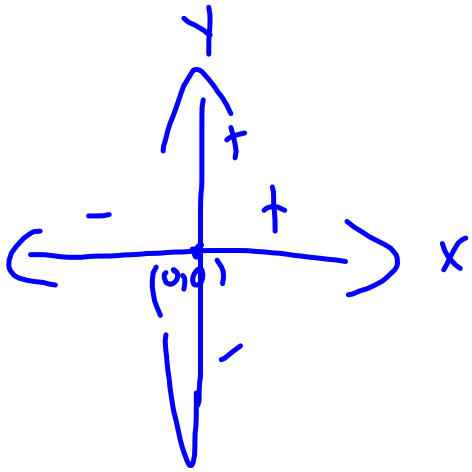
m = rise/run : $\frac{-7}{1}$ or $\frac{7}{-1}$

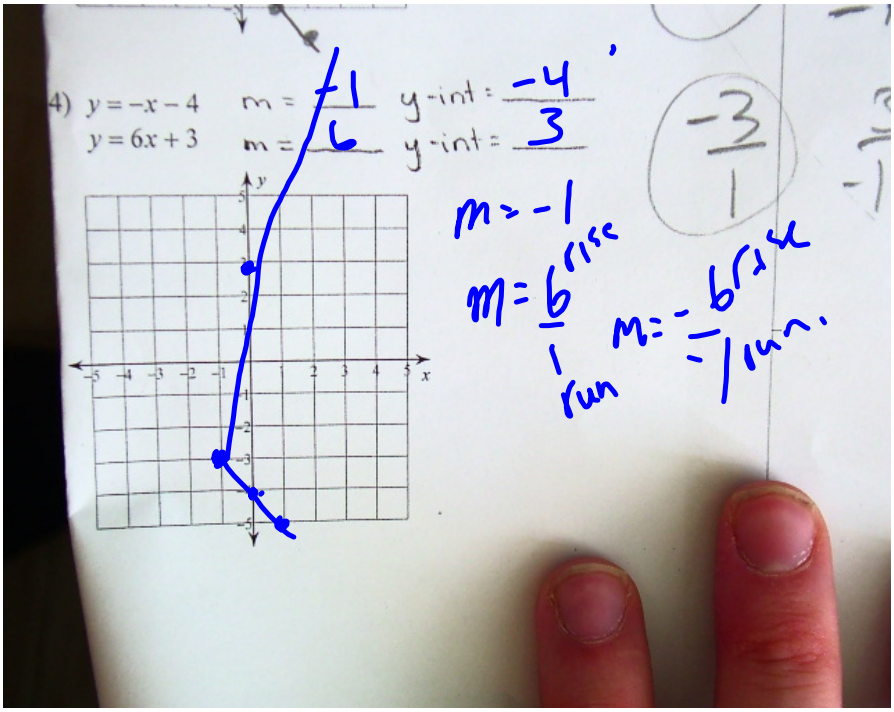
Solution ⇒ where two lines touch

(1, -4)

m = rise/run

$m = \frac{\text{rise}}{\text{run}}$ $\frac{4}{3}$




4) y = −x − 4
m = −1
y-int = −4
y = 6x + 3
m = 6
y-int = 3
m = −1
m = 6 rise / 1 run
m = −6 rise / −1 run.
−3 / 1

There are other ways to solve Systems of Equations!

Elimination

Elimination is when you "eliminate" one of the variables.

Elimination by Addition

$$y - 2x = 5$$
$$-y - x = 4$$

Make sure the corresponding variables, constants and equal signs are lined up.

You must explain what you are doing.

Elimination by Addition

Consider the system

$x - 2y = 5$ ←

$2x + 2y = 7$ ←

Elimination by Addition

Consider the system

$$\begin{array}{rl} & x - 2y = 5 \\ + & 2x + 2y = 7 \\ \hline \end{array}$$

Lets add both equations to each other

Elimination by Addition

$x + 3y = 14$

$-x + 4y = 7$

Who would you eliminate??

Elimination by Addition

$x + 3y = 14$

$-x + 4y = 7$

Elimination By Subtraction

$6x + 11y = -5$

$6x + 9y = -3$

$$x - 2y = -12$$
$$-2y - 6x = 16$$

$$-3x - 5y = 10$$

$$-3x - 7y = 14$$

Solve the following System of Equations

$$3x + y = 0$$
$$-x + y = 8$$

Make sure the corresponding variables, constants and equal signs are lined up.

You must explain what you are doing.

Solve the following System of Equations

$$-2x + y = -7$$
$$-4x + 10y = -6$$

Make sure the corresponding variables, constants and equal signs are lined up.

You must explain what you are doing.

Solve the following System of Equations

$$-2x + 8y = 2$$
$$3x - 3y = 15$$

Make sure the corresponding variables, constants and equal signs are lined up.

You must explain what you are doing.

Try these:

1.

$$x - 2y = 5$$
$$+\ 2x + 2y = 7$$

2.

$$6x + 11y = -5$$
$$6x + 9y = -3$$

3.

$$x + 2y = 6$$
$$3x + 3y = -6$$

1.

$$\begin{array}{rl} x - 2y = 5 & \leftarrow \\ +\ 2x + 2y = 7 & \leftarrow \\ \hline 3x \quad = 12 & \end{array}$$

Lets add both equations to each other

solve for x

$x = 4$

ANS: (4, y)

Now solve for y (HOW???)

- sub the value of x into one of the equations and solve for y

$$x - 2y = 5$$
$$4 - 2y = 5$$
$$-2y = 1$$
$$y = \frac{-1}{2}$$

intersection point (4, - 0.5)

2.

Careful you are subtraction all of the second
(switch all signs on t second equation)

$$6x + 11y = -5$$
$$-6x - 9y = +3$$
$$2y = -2$$

$$y = -1$$

solve for x

$$6x + 11y = -5$$
$$6x + 11(-1) = -5$$
$$6x - 11 = -5$$
$$6x = -5 + 11$$
$$6x = 6$$
$$x = 1$$

Intersection (1, -1)

3.

Consider the system

$$3x + 6y = 18$$
$$-3x - 3y = +6$$

Now subtract the equations

$$3y = 24$$

$$y = 8$$

Sub into equation 1 (original) or the above

$$x + 2y = 6$$
$$x + 2(8) = 6$$
$$x + 16 = 6$$
$$x = 6 - 16$$
$$x = -10$$

$$(-10, 6)$$

STOP