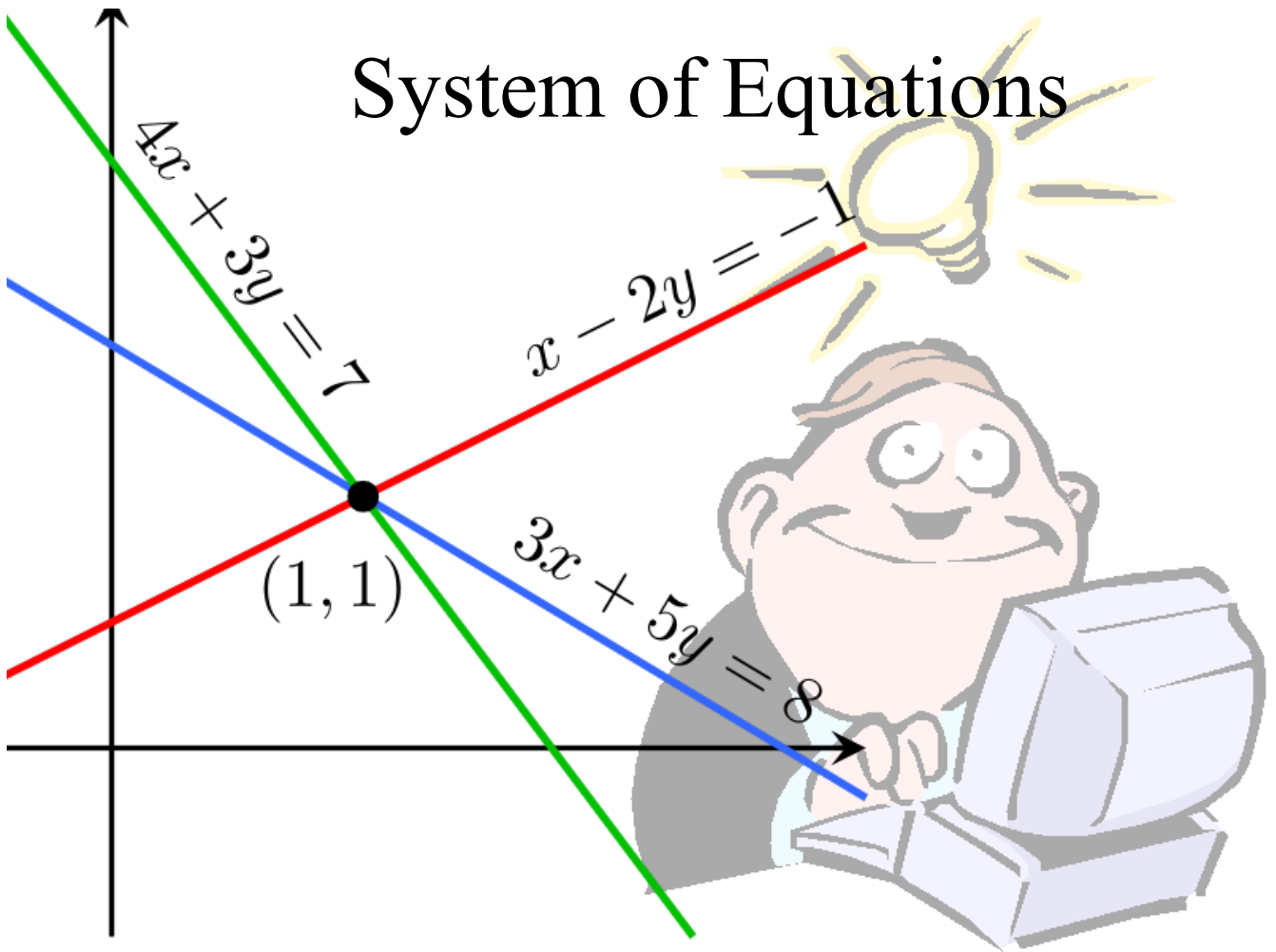


# System of Equations

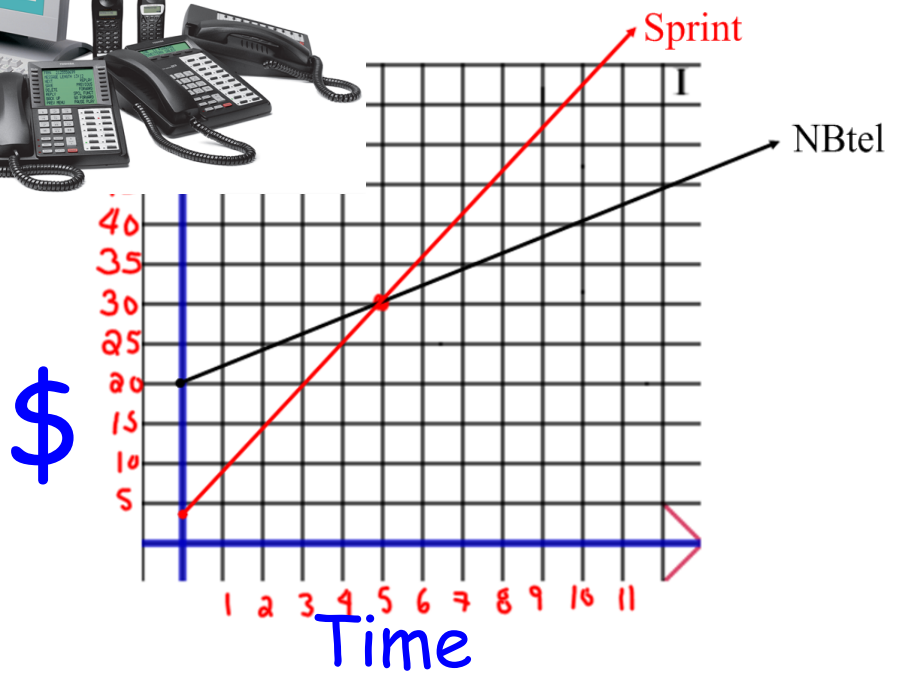


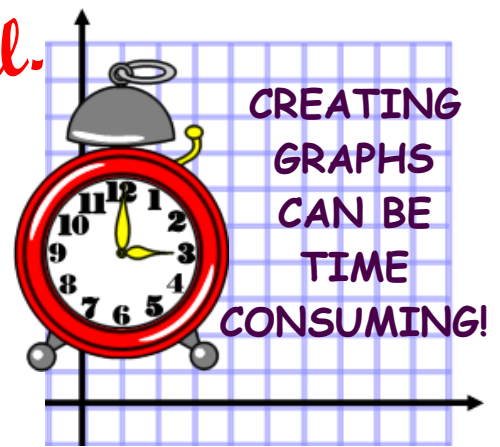
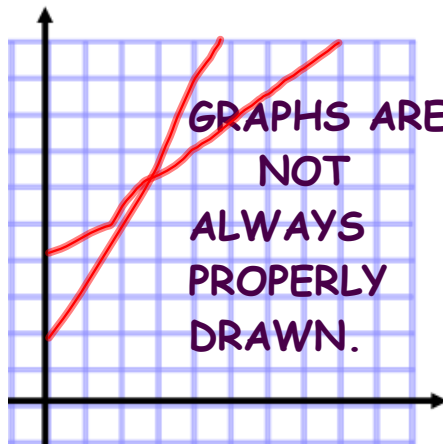
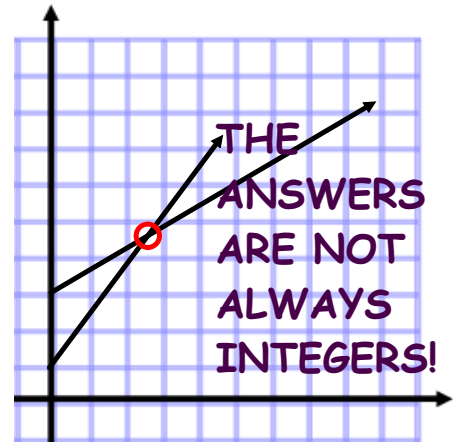
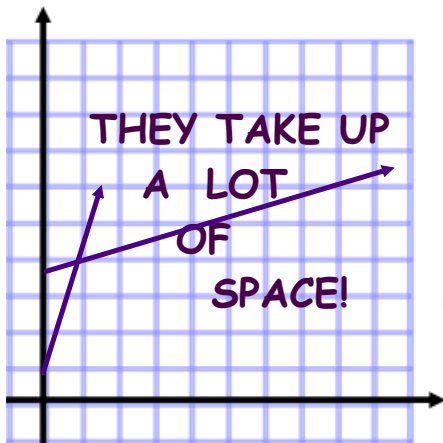
### Internet Service

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??

NBtel \_\_\_\_\_  
Sprint \_\_\_\_\_

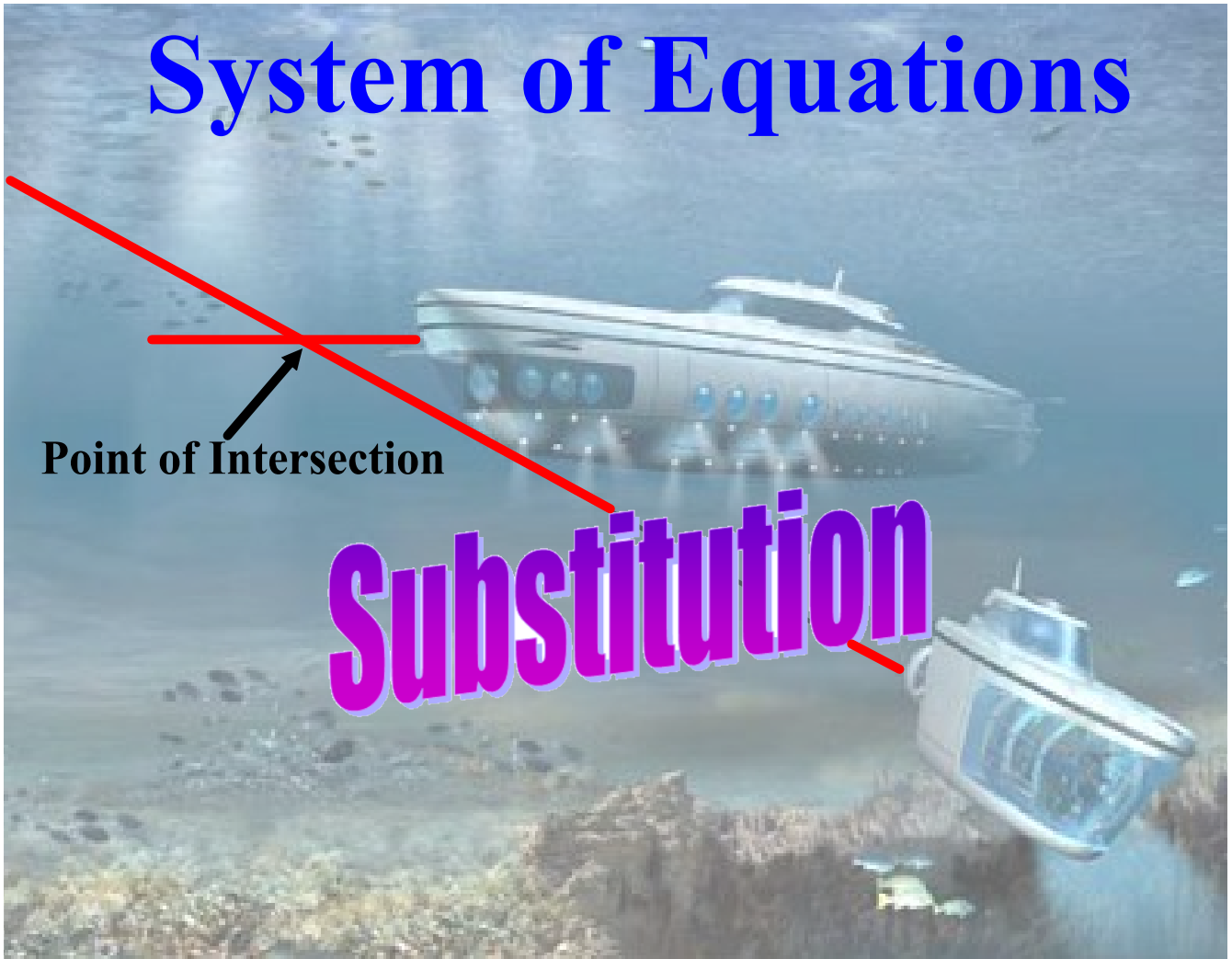




*Graphing  
is not  
always  
practical.*

There are other ways to solve  
Systems of Equations!

# System of Equations

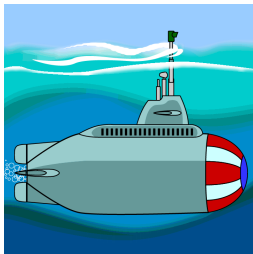


## Substitution Method

Steps:

- i) Choose one equation and isolate one variable;  
this equation will be considered the first equation.  
(easiest one to get  $x=$  or  $y=$  from either eqn 1 or eqn 2)
- ii) Substitute the solution from step 1 into the second equation and solve for the variable in the equation.
- iii) Using the value found in step 2, substitute it into the first equation and solve for the second variable.
- iv) Substitute the values for both variables into both equations to show they are correct.

# Substitution



$(-1, 0)$

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

$$3x - 8y = -3$$

$$3x - 8(3 + 3x) = -3$$
$$3x - 24 - 24x = -3 + 24$$

$$-21x = 21$$
$$\frac{-21x}{-21} = \frac{21}{-21}$$
$$x = -1$$

$$y = 3 + 3x$$
$$y = 3 + 3(-1)$$
$$y = 3 - 3$$
$$y = 0$$

You need to isolate  $x$  or  $y$

## Use Substitution to Find the Point of Intersection

$$\begin{aligned}x - 4y &= 6 \\ 7x + 6y &= 8\end{aligned}$$

Isolate  $x$

$$x - 4y = 6$$

$$x = 6 + 4y$$

$$7x + 6y = 8$$

$$7(6 + 4y) + 6y = 8$$

$$42 + 28y + 6y = 8 - 42$$

$$\begin{aligned}34y &= -34 \\ \frac{34y}{34} &= \frac{-34}{34} \\ y &= -1\end{aligned}$$

You need to isolate  $x$  or  $y$

$$\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 2 \\ -1 \end{pmatrix}$$

$$x = 6 + 4y$$

$$x = 6 + 4(-1)$$

$$x = 6 - 4$$

$$x = 2$$



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# Substitution

You need to isolate x or y

$$y = 2x + 2$$

$$y = 6x + 14$$

$$\begin{array}{l} x, y \\ (-3, -4) \end{array}$$

1 2 3 4 5



$$y = 6x + 14$$

$$2x + 2 = 6x + 14$$

$$2x - 6x = 14 - 2$$

$$\frac{-4x}{-4} = \frac{12}{-4}$$

$$x = -3$$

$$\begin{array}{l} y = 2(-3) + 2 \\ = -6 + 2 \\ = -4 \end{array}$$

What if??

$$\cancel{8x - 2y = -2}$$

$$-4x + 3y = 11$$

You need to isolate x or y

$$\begin{matrix} x & , & y \\ (1, 5) \end{matrix}$$

isolate y.

$$\textcircled{8x} + 2y = -2 - 8x$$

$$\Rightarrow 2y = \frac{-2 - 8x}{2}$$

$$y = \textcircled{1 + 4x}$$

$$-4x + 3y = 11$$

$$-4x + 3(1 + 4x) = 11$$

$$\underline{-4x} + \underline{3} + \underline{12x} = 11 - 3$$

$$\frac{8x}{8} = \frac{8}{8}$$

$$x = 1$$

$$\begin{aligned} y &= 1 + 4x \\ y &= 1 + 4(1) \\ y &= 1 + 4 \\ y &= 5 \end{aligned}$$