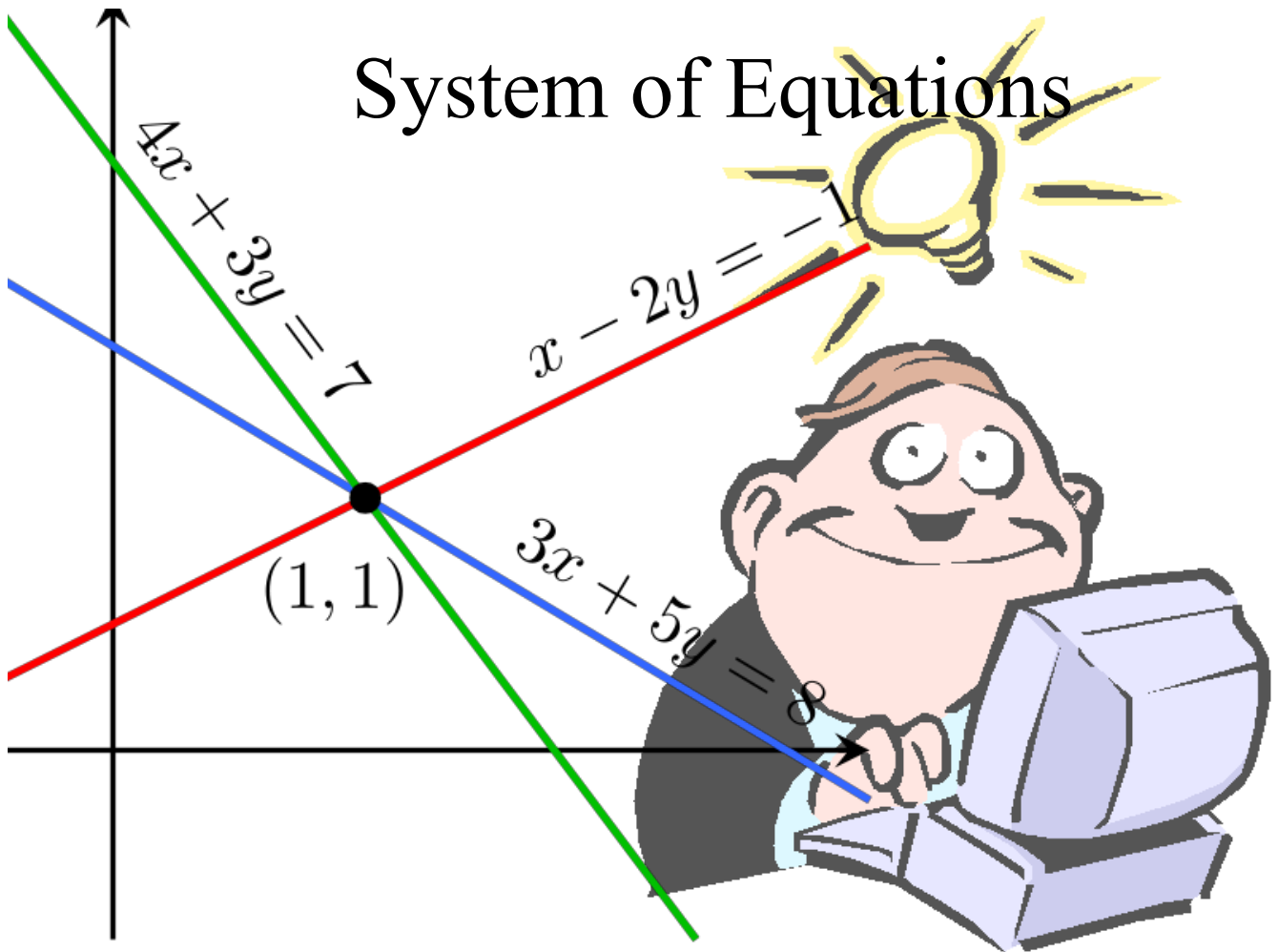


System of Equations

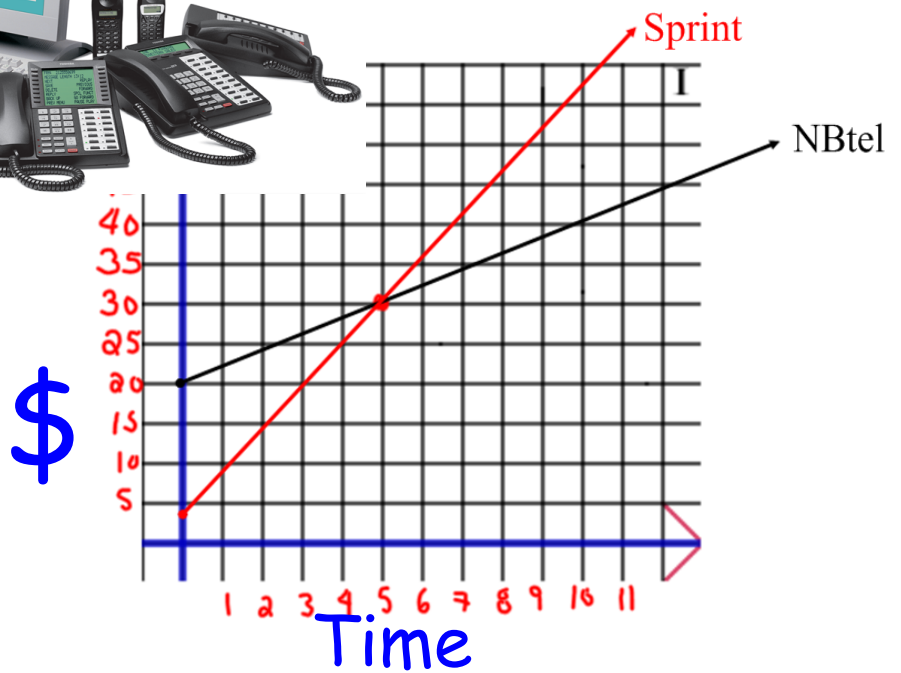


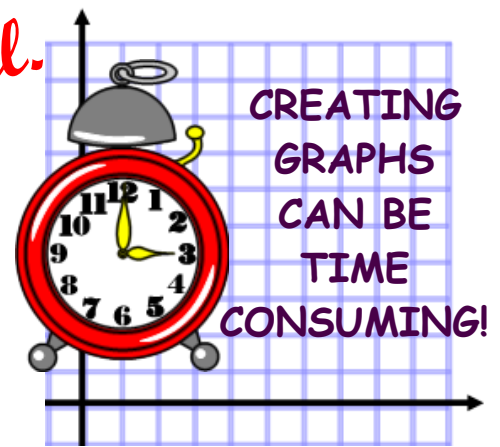
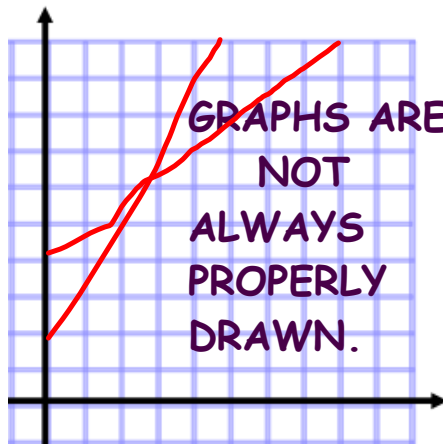
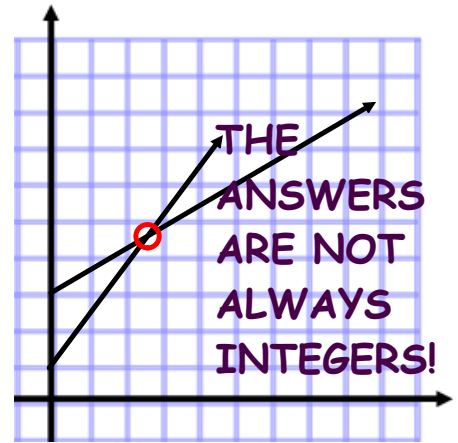
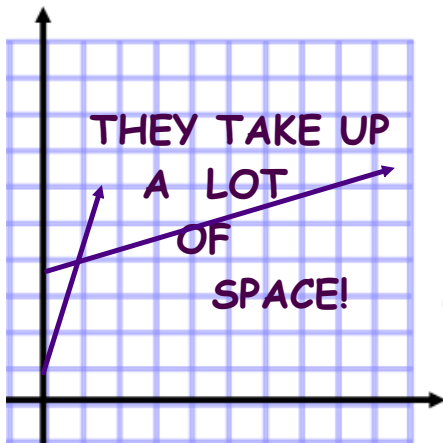
Internet Service

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 _____

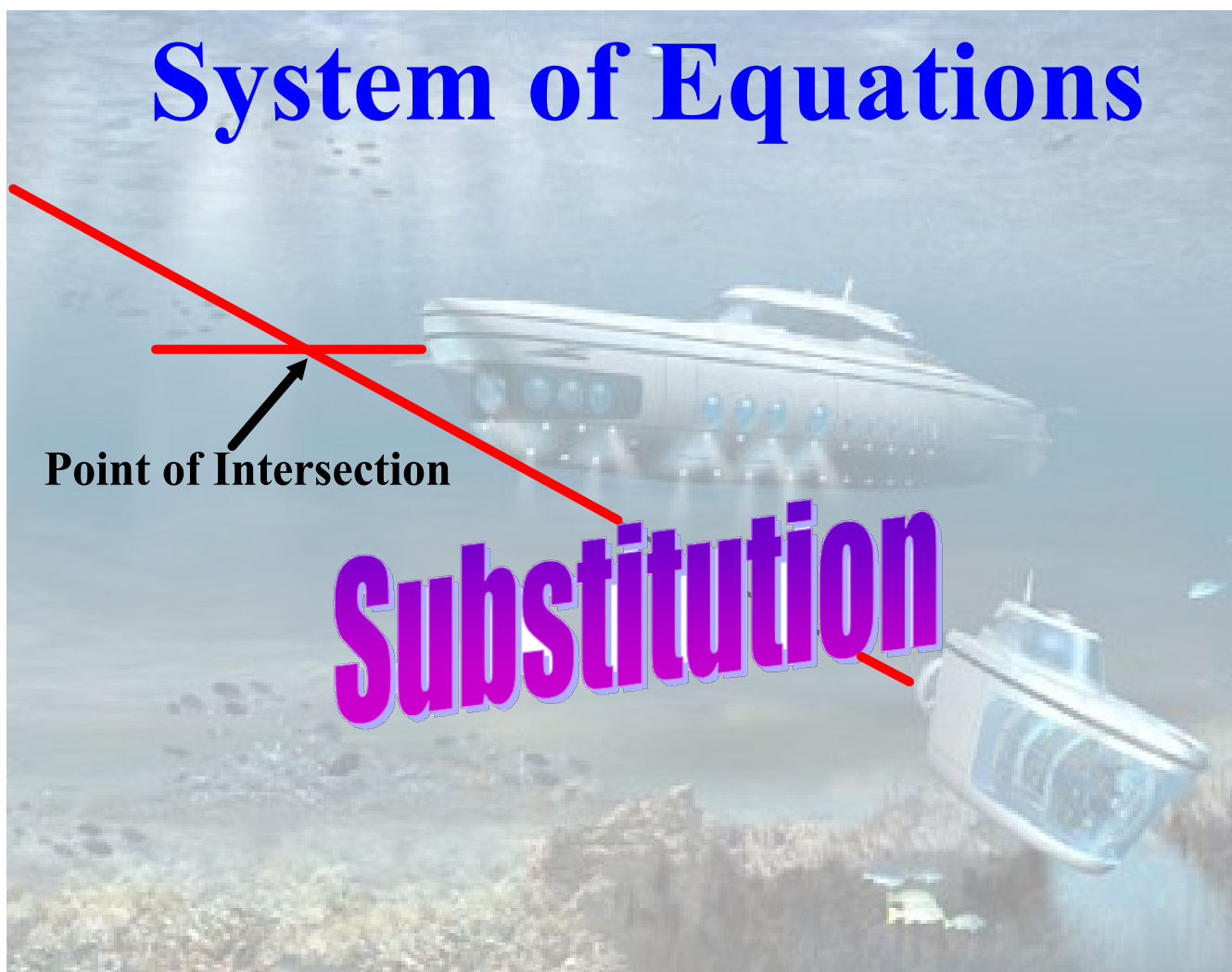




*Graphing
is not
always
practical.*

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

You need to isolate x or y

$$y = 3 + 3x \quad (1)$$

$$+3x - 8y = -3 \quad (2)$$

Sub in (2)

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

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

$$3x - 24 - 24x = -3$$

$$-21x - 24 = -3 + 24$$

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

$$x = -1$$

$$\begin{matrix} x, y \\ (-1, 0) \end{matrix}$$

Sub in X

$$y = 3 + 3x$$

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

$$y = 3 - 3$$

$$y = 0$$

Use Substitution to Find the Point of Intersection

$$\begin{aligned} x - 4y &= 6 & \textcircled{1} \\ 7x + 6y &= 8 & \textcircled{2} \end{aligned}$$

You need to isolate x or y

rearrange $\textcircled{1}$

$$x - 4y = 6 + 4y$$

$$x = 6 + 4y$$



Sub in $\textcircled{2}$

$$7x + 6y = 8$$

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

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

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

$$\frac{34y}{34} = \frac{-34}{34}$$

x, y
(2, -1)

$$y = -1$$

$$x = 6 + 4y$$

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

$$x = 6 - 4$$

$$x = 2$$

Substitution

You need to isolate x or y

$$y = 2x + 2 \quad \textcircled{1}$$

$$y = 6x + 14 \quad \textcircled{2}$$



Sub 2

$$y = 6x + 14$$

x, y
(-3, -4)

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

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

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

$$x = -3$$

$$y = 2x + 2$$

$$y = 2(-3) + 2$$

$$y = -6 + 2$$

$$y = -4$$

What if??

$$\cancel{8x - 2y = -2} \text{ (1) You need to isolate x or y}$$

$$\underline{-4x + 3y = 11} \text{ (2)}$$

rearrange (1)

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

$$\frac{-1}{2}y = \frac{-2}{-2} - \frac{8x}{-2}$$

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

Sub in (2)

$$-4x + 3\textcircled{y} = 11$$

$$\begin{pmatrix} x, y \\ 1, 6 \end{pmatrix}$$

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

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

$$\begin{aligned} 8x &= 8 \\ \frac{8x}{8} &= \frac{8}{8} \\ x &= 1 \end{aligned}$$

$$y = 1 + 4(1)$$

$$y = 1 + 4$$

$$y = 5$$

Solve this system of equation by substitution.

$$y = 15 + 6x$$

$$-3x - 2y = 0$$

$$-3x - 2y = 0$$

$$-3x - 2(15 + 6x) = 0$$

$$-3x - 30 - 12x = 0$$

$$-3x - 12x = 0 + 30$$

$$-15x = 30$$

$$x = -2$$

$$y = 15 + 6x$$

$$y = 15 + 6(-2)$$

$$y = 15 - 12$$

$$y = 3$$

$$(-2, 3)$$

Solve the system by Substitution Method



$$\begin{aligned} \cancel{x + 2y} &= 3 \quad \textcircled{1} \\ 3x + 5y &= 8 \quad \textcircled{2} \end{aligned}$$

rearrange
①

$$x + 2y = 3$$

$$x = 3 - 2y$$

.....solve for x..... $x = 3 - 2y$

Sub in ②

$$\begin{aligned} 3x + 5y &= 8 \\ 3(3 - 2y) + 5y &= 8 \\ 9 - 6y + 5y &= 8 \\ -6y + 5y &= 8 - 9 \\ y = 1 \quad \frac{-y}{-1} &= \frac{-1}{-1} \end{aligned}$$

$$\begin{aligned} x + 2y &= 3 \\ x + 2(1) &= 3 \\ x + 2 &= 3 \\ x &= 3 - 2 \\ x &= 1 \end{aligned}$$

(1,1)

Use Substitution to Find the Point of Intersection

$$\begin{array}{l} \cancel{2x + y = 9} \quad (1) \\ 3x - 5y = -19 \quad (2) \end{array}$$

rearrange
①

$$2x + y = 9$$

$$y = 9 - 2x$$

Sub in ②

$$3x - 5y = -19$$

$$3x - 5(9 - 2x) = -19$$

$$3x - 45 + 10x = -19 + 45$$

$$\frac{13x}{13} = \frac{26}{13}$$

$$x = 2$$

$$(2, 5)$$

Sub in x

$$y = 9 - 2x$$

$$y = 9 - 2(2)$$

$$y = 9 - 4$$

$$y = 5$$

