System of Equations

$4x + 3y = 7$

$x - 2y = -1$

$3x + 5y = 8$

$(1, 1)$

Internet Service

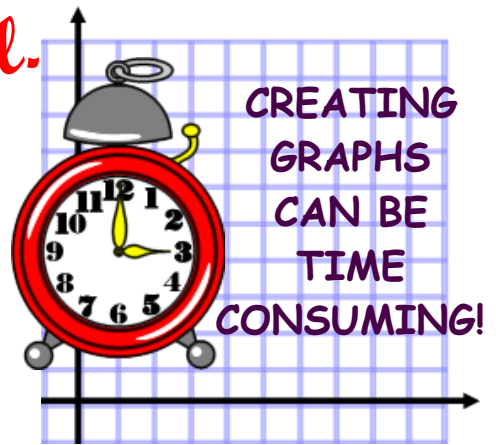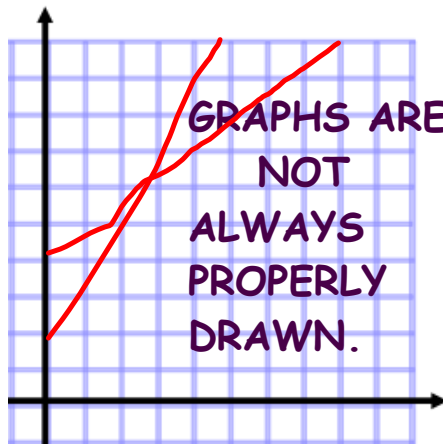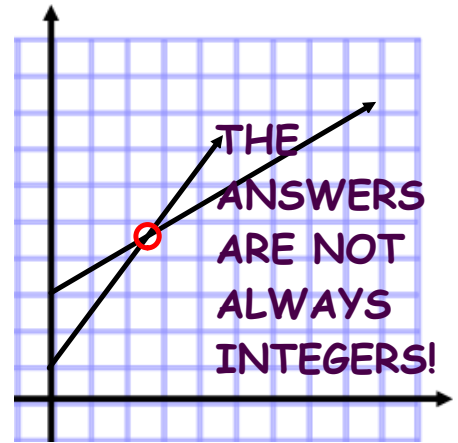NBtel charges a monthly fee of $20.00, and an additional $2.00 per hour.
Sprint charges a monthly fee of $10.00, and an additional $4.00 per hour.

Equation??

NBtel _____
Sprint _____

$

Sprint

NBtel

40
35
30
25
20
15
10
5

1 2 3 4 5 6 7 8 9 10 11

Time

THEY TAKE UP A LOT OF SPACE!

THE ANSWERS ARE NOT ALWAYS INTEGERS!
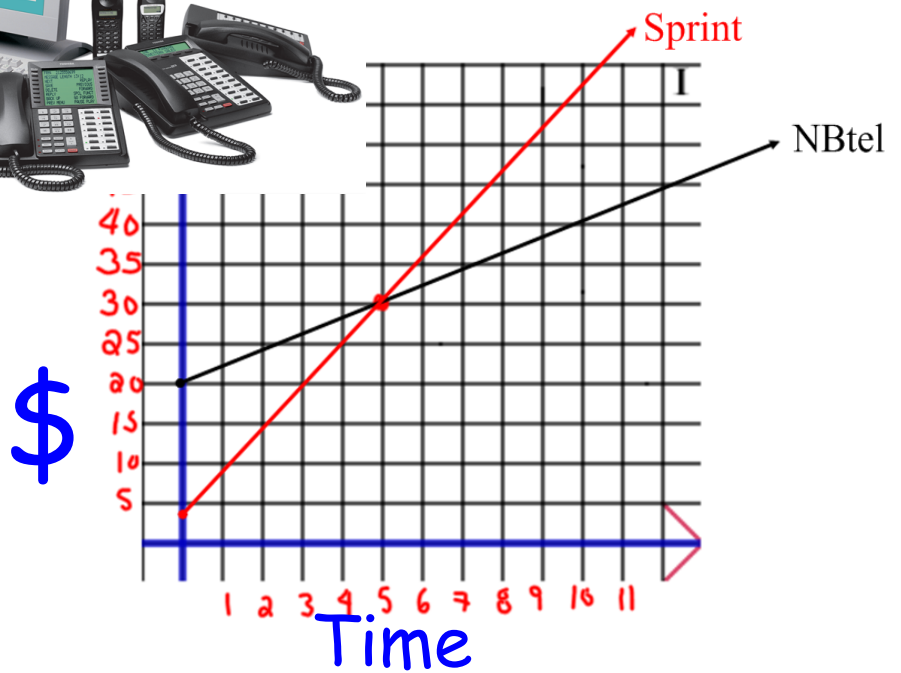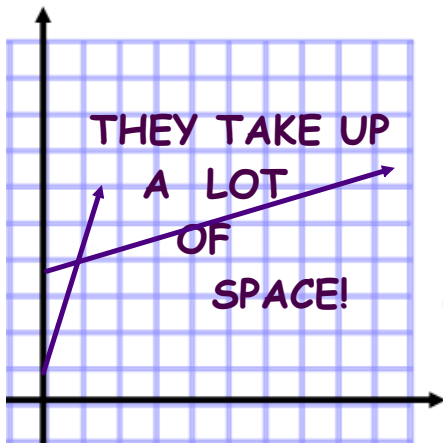
Graphing is not always practical.

GRAPHS ARE NOT ALWAYS PROPERLY DRAWN.

CREATING GRAPHS CAN BE TIME CONSUMING!

There are other ways to solve
Systems of Equations!

System of Equations

Point of Intersection
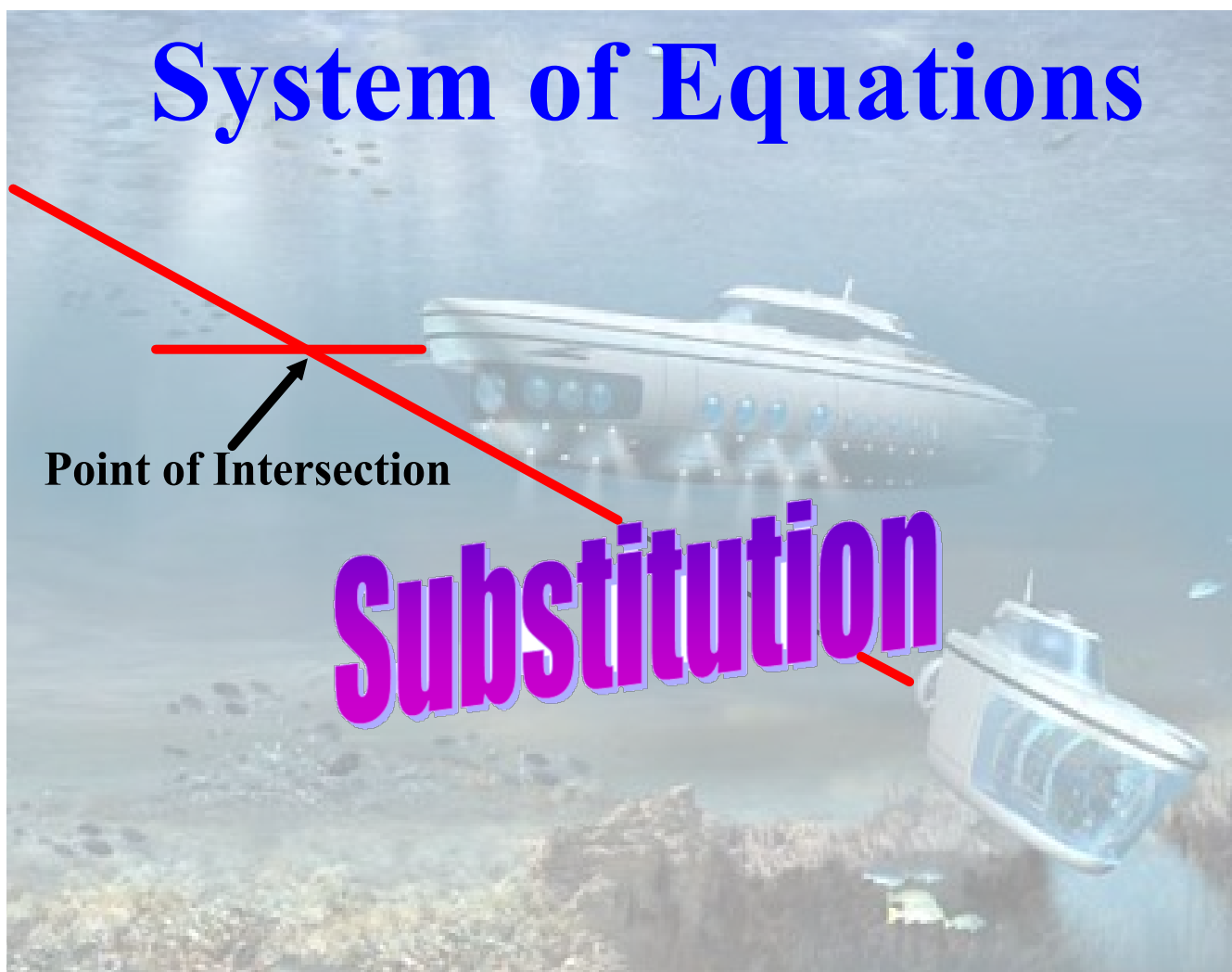
Substitution

Substitution

You need to isolate x or y

$y = \boxed{3+3x}$ ①
$+3x - 8y = -3$ ②

Sub in ②

$3X - 8y = -3$

Sub in (x = -1)

$y = 3 + 3x$

$\left(\overset{?}{x}, \overset{?}{y}\right)$

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

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

$\boxed{(-1, 0)}$

$\boxed{3X} - 24 \boxed{-24X} = -3$

$-21X - \boxed{24} = -3 + 24$

$\dfrac{-21X}{-21} = \dfrac{+21}{-21}$

$x = -1$

Use Substitution to Find the Point of Intersection

x - 4y = 6   ①
7x + 6y = 8   ②

You need to isolate x or y

(x, y)

$(2, -1)$

Rearrange ①

$x - 4y = 6$ ①

$x = 6 + 4y$

Sub in 7x + 6y = 8
②

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

$42 + 28y + 6y = 8$

$42 + 34y = 8 - 42$

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

$y = -1$

Sub in y

$x = 6 + 4y$

$x = 6 + 4(-1)$

$x = 6 - 4$

$x = 2$

7

Substitution

You need to isolate x or y

$$y = (2x + 2) \textcircled{1}$$
$$y = 6x + 14 \textcircled{2}$$

12345

Sub in ② $y = 6x + 14$

Sub in $(x = -3)$

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

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

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

$$x = -3$$

x, y

$(-3, \ )$

$$y = 2x + 2$$
$$y = 2(-3) + 2$$
$$y = -6 + 2$$
$$y = -4$$

What if?? $8x-2y=-2$ ① You need to isolate x or y

$-4x+3y=11$ ②

Rearrange $8x-2y=-2$

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

$$y=1+4x$$

Sub in ② $-4x+3y=11$

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

$-4x+3+12x=11$

$(1,5)$ $8x+3=11-3$

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

$x=1$

Sub in $(x=1)$

$y=1+4x$

$y=1+4(1)$

$y=1+4$

$y=5$

Solve this system of equation by substitution.

$y = 15+6x$ ①

$-3x -2y = 0$ ②

$-3x -2y = 0$

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

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

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

$-15x = 30$

$x = -2$

Sub in X=-2 $y = 15+6x$

$y = 15 + 6(-2)$

$y = 15 - 12$

$y = 3$

$(-2,3)$

Solve the system by Substitution Method

$$x + 2y = 3$$
$$3x + 5y = 8$$

......solve for x......➤   x = 3 - 2y

3x   + 5y = 8
3(3-2y) + 5y = 8
9 - 6y + 5y = 8
   - 6y + 5y = 8 -9
y = 1   -y = -1

x + 2y   = 3
x + 2(1) = 3
x + 2   = 3
x   = 3-2
x   = 1

(1,1)