Using this line: $8x + 6y = 24 \rightarrow y = \frac{24-8x}{6} \rightarrow m = -4/3$

Write the equation of a second line that would lead to the given number of solutions:

1. One solution

any y-int

$y = \_\_x + \_\_$

$\neq$ anything but $-4/3$

2. No solution

$y = -4/3x + \_\_$

anything but 4

3. Many solutions:

same line → either $8x+6y=24$ or $y = 4 - 4/3x$

Solving a system of equations using Substitution:

- You must know what one of the variables "equals"
- Take information from one equation and place it into the other equation.

The gym teacher ordered some basketballs and some footballs. The number of basketballs is three less than twice the number of footballs. Basketballs cost $35 each and footballs cost $28 each. The gym teacher spent a total of $875.

Write and solve a system of equations to find the number of each kind of ball that was purchased.

B = # Basketballs

F = # football

$B = 2F - 3$

$35B + 28F = 875$

$35(2F-3) + 28F = 875$

$F = 10$

Find B

$B = 2(10) - 3$

$B = 17$

Solution: (17, 10) B, F → 17 Basketballs & 10 footballs

Solve.

$P = \frac{5}{3}Q - 7$

$P = \frac{7}{6}Q - 4$

LCM of 6 & 3 is 6

$6\left(\frac{5}{3}Q - 7\right) = \left(\frac{7}{6}Q - 4\right)6$

$10Q - 42 = 7Q - 24$

$-7Q \quad -7Q$

$3Q - 42 = -24$

$+42 \quad +42$

$\frac{3Q}{3} = \frac{18}{3}$

$Q = 6$

Sol: (3, 6) (P, Q)

find P:

$P = \frac{7}{6}Q - 4$

$= \frac{7}{6}(6) - 4$

$P = 7 - 4 = 3$

Solve.

2.

$h = 3g + 5$

$7g - 2h = -8$

$7g - 2(3g+5) = -8$

$7g - 6g - 10 = -8$

$g - 10 = -8$

$+10 \quad +10$

$g = 2$

find h:

$h = 3g + 5$

$= 3(2) + 5$

$= 11$

Sol: (2, 11) (g, h)

3. Solve this system of equations using Subsitution:

$m + n = 80$ $\quad$ $8m + 5n = 481$

$-n \quad -n$

$m = 80 - n$

$8(80-n) + 5n = 481$

$640 - 8n + 5n = 481$

$640 - 3n = 481$

$-640 \quad -640$

$\frac{-3n}{-3} = \frac{-159}{-3}$

$n = 53$

now replace n with 53 to find m.

$m = 80 - 53$

$m = 27$

(27, 53)

Sol

4. In your piggy bank you have only nickels and dimes. There are a total of 31 coins that total $2.25

a) Write a system of equations involving n for nickels and d for dimes.

$n + d = 31$ $\quad$ $.05n + .10d = 2.25$

$-d \quad -d$

$n = 31 - d$

b) Solve this system of equations to find the number of each kind of coin.

$.05(31-d) + .10d = 2.25$

$1.55 - .05d + .10d = 2.25$

$1.55 + .05d = 2.25$

$-1.55 \quad -1.55$

$\frac{.05d}{.05} = \frac{.70}{.05}$

$d = 14$

$n = 31 - d = 31 - 14 = 17$

14 dimes & 17 nickels