Warm-Up

Use the substitution method to solve the following system of equations:

$2x + y = 11$

$y = 4x + 17$

$2x + (4x + 17) = 11$

$6x + 17 = 11$

$6x = -6$

$x = -1$

$y = 4x + 17$

$y = 4(-1) + 17$

$y = -4 + 17$

$y = 13$

$(-1, 13)$

Questions From Homework

⑤ $\div 10$ $-80x - 60y = -20$

$\div 8$ $-64x - 48y = -16$

$-8x - 6y = -2$

$\Leftrightarrow -8x - 6y = -2$

$0 = 0$ → Infinite # of Solutions

⑪ $-y = 3 + 2x$

$y = -3 - 2x$

$y = -2x - 3$

$m = -2$

$b = -3$

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

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

$y = -2x - 2$

$m = -2$

$b = -2$

Since the lines have the same slope we know they are parallel and therefore will not intersect.

No Solution

Solving Word Problems

Applications

Step 1: Read the problem (multiple times!)

Step 2: Define the two variables in the problem

Step 3: Set up the equations from the problem
(# equations = # unknowns)

Step 4: Solve the system of equations

Step 5: State your conclusion

A landscaping company placed two orders with a nursery. The first order was for 13 shrubs 4 trees and totaled $487. The second order was for 6 shrubs and 2 trees and it totaled $232. Determine the cost of each.

Let x = shrub ($)

Let y = tree ($)

$13x+4y=487$

(2) $6x+2y=232$

$13x+4y=487$

$\hookleftarrow \underline{12x+4y=464}$

$x=23$

$6(23)+2y=232$

$138+2y=232$

$2y=94$

$y=47$

∴ A shrub costs $23 and a tree will set you back $47.

The admission to the fair is $2 for children and $4 for adults. On Saturday one thousand people attended and $2800 was collected. How many children and how many adults attended the fair?

Let x = # of children

Let y = # of adults

$$2x+4y=2800$$

$$x+y=1000$$

$$2x+4y=2800$$

$$(-)\ 2x+2y=2000$$

$$2y=800$$

$$y=400$$

$$x+y=1000$$

$$x+400=1000$$

$$x=600$$

∴ 600 children + 400 adults attended.

A pizza costs $10 more than a donair. If two pizzas and three donairs cost $40, find the cost of each item.

Let x = pizza ($)
Let y = donair ($)

$2x + 3y = 40$

$x = y + 10$

$2(y+10)+3y=40$

$2y+20+3y=40$

$5y=20$

$y=\$4$

$x=y+10$

$x=4+10$

$x=\$14$

A total of $12,000 is invested in two funds paying 9% and 11% simple interest. If the yearly interest is $1,180, how much of the $12,000 is invested at each rate?

Let x = investment @ 9%

Let y = " @ 11%

$$x + y = 12000$$

$$0.09x + 0.11y = 1180$$

$$9x + 9y = 108000$$

$$(\times -1) \quad 9x + 11y = 118000$$

$$-2y = -10000$$

$$y = \$5000$$

$$x + y = 12000$$

$$x + 5000 = 12000$$

$$x = \$7000$$

$\therefore$ \$5000 is invested @ 11%

\$7000 " " @ 9%

Homework