

KEY: With each problem we will show fewer steps and explanations to allow you to do more yourself.

1. You go to the store and buy three pairs of pants and two shirts, spending \$65. Your friend buys one pair of the same pants and five of the same shirts as you bought. They spend \$65 as well. What are the prices at this store for pants and shirts?

Define Variables: number of pants bought = p , number of shirts bought = s

Equation 1: $3p + 2s = 65$

Equation 2: $p + 5s = 65$

Solving: $p = 65 - 5s$ (solve for p in the second equation)

$$3(65 - 5s) + 2s = 65 \quad (\text{substitute this value into the first equation for } p)$$

$$195 - 15s + 2s = 65 \quad (\text{distributive property})$$

$$195 - 13s = 65$$

$$195 - 65 = 13s \quad (\text{additive and subtractive properties of equality})$$

$$130 = 13s$$

$$s = 10$$

Now substitute this value into the second equation to find the value of p

$$p = 65 - (5 \cdot 10)$$

$$p = 65 - 50$$

$$p = 15$$

Re-state as answer to the question: At this store, pants cost \$15 a pair and shirts cost \$10 each.

2. You have a tub of trail mix that is 40% peanuts. You want to mix it with a trail mix that is 20% peanuts to make a 35% peanut blend. Your result weighs 30 lb. How much of each type of trail mix did you use?

Define variables: pounds of 40% peanut mix = x , pounds of 20% peanut mix = y

Equation 1: $0.40x + 0.20y = 0.35(30)$

Equation 2: $x + y = 30$

Solving: $x = 30 - y$

$$0.40(30 - y) + 0.20y = 10.5$$

Solve for y ,

$$(10) + y = 30$$

$$y = 20$$

3. The sum of two numbers is 56. The difference between the numbers is 24. What are the two numbers?

Equation 1: $x + y = 56$

Equation 2: $x - y = 24$

Solving: x

$$2x = 80$$

$$x = 40$$

Solve for y ,

$$(40) + y = 56$$

$$y = 16$$