Writing Equations

Fill in the guided notes as you watch the video in the Digital Toolbox.

- When writing an equation from a word problem, **read** the problem carefully.
- Ask yourself, "What are the key pieces of information in this problem?"
  - Circle, highlight, or mark **information** you think is important.
  - Determine mathematical words being used that imply **operations**.
  - Sketch a **picture** if needed.
- Define the **variable(s)** you will use for the problem.

Example 1

Complete the example as you watch the video in the Digital Toolbox.

Kelly wrote an article after attending the school art show. The art teacher shared that two-thirds of the submissions were paintings, and the rest were pottery. If Kelly counted twenty pieces of pottery, what was the total number of submissions for the art show?

a: art pieces

$1 - \frac{2}{3} = \frac{1}{3}$ of the art is pottery

$$\frac{1}{3}a = 20$$

$$(3)\frac{1}{3}a = 20(3)$$

$$a = 60$$

The art show had 60 art pieces.

Example 2

Complete the example as you watch the video in the Digital Toolbox.

Daniel bought 4 shirts and a pair of pants. The pants were $25.50. He spent a total of $84.50. How much was each shirt?

x = cost of a shirt

$$4x + 25.50 = 84.50$$
$$-25.50 \quad -25.50$$
$$\frac{4x}{4} = \frac{59}{4}$$
$$x = 14.75$$

The cost of one shirt is $14.75.

Example 3

Complete the example as you watch the video in the Digital Toolbox.

Patrick and Joseph decide to make homemade pasta for dinner. The ratio of cups of flour to eggs is three to two. If nine people are eating dinner, and the recipe notes suggest that you use one egg per person, how much of each ingredient is needed?

f = flour
e = eggs
p = people

$$\frac{p}{e} = \frac{1}{1}$$
$$\frac{9}{e} = \frac{1}{1}$$
$$e = 9$$

$$\frac{f}{e} = \frac{3}{2}$$
$$\frac{3}{2} = \frac{f}{9}$$
$$3(9) = 2f$$
$$\frac{27}{2} = \frac{2f}{2}$$
$$f = 13\frac{1}{2}$$

Patrick and Joseph will need $13\frac{1}{2}$ cups of flour and 9 eggs to make the pasta.

Practice

Complete the problems. Show your work.

1) Russell bought half of all of the available bunches of bananas. The store had 14 bunches left. How many bunches of bananas did the store originally have?

b: bunches of bananas

$$\frac{1}{2}b = 14$$

$$\left(\frac{2}{1}\right)\frac{1}{2}b = 14\left(\frac{2}{1}\right)$$

$$b = 28$$

The store originally had 28 bunches of bananas.

2) Donna bought three packages of strawberries and two pounds of grapes. The cost of one pound of grapes is $1.75. If Donna spent a total of $10.50, what is the cost of one package of strawberries? Round to the nearest cent.

w: strawberries, g: grapes

$$3w + 2g = 10.50$$

$$3w + 2(1.75) = 10.50$$

$$3w + 3.50 = 10.50$$

$$-3.50 \quad -3.50$$

$$\left(\frac{1}{3}\right)3w = 7\left(\frac{1}{3}\right)$$

$$w = \frac{7}{3} = 2\frac{1}{3}$$

$$w = 2.33$$

One package of strawberries costs $2.33.

3) Tate is paid $12 per hour. If Tate has already saved $120, how many hours does he need to work to have a total of $360?

$$h = \text{ hours}$$

$$12h + 120 = 360$$

$$-120 \quad -120$$

$$\left(\frac{1}{12}\right)12h = 240\left(\frac{1}{12}\right)$$

$$h = 20$$

Tate needs to work 20 hours to have $360.

Complete the problems. Show your work.

4) Sara earns $50 for every lawn she mows. She wants to save $750 this summer. Sara has already mowed three lawns. How many more lawns does she need to mow to reach her goal?

m = lawns to mow

$$50m + 3(50) = 750$$
$$50m + 150 = 750$$
$$-150 \quad -150$$
$$\left(\frac{1}{50}\right)50m = 600\left(\frac{1}{50}\right)$$
$$m = 12$$

Sara must mow 12 more lawns to reach her goal.

5) Natalee and her family took a trip to the botanical gardens where she counted 10 butterflies on a single plant. The ratio of Monarch butterflies to Viceroy butterflies was 2 to 3. How many of each type of butterfly were on the plant?

Hint: The ratio of Monarch butterflies to the total number of butterflies is 2 to 5. You can apply the same idea to Viceroy butterflies.

m: Monarch, v: Viceroy, t: total

$$\frac{m}{v} = \frac{2}{3}$$

$$\frac{m}{t} = \frac{2}{5} \quad \text{or} \quad \frac{v}{t} = \frac{3}{5}$$
$$\frac{m}{10} = \frac{2}{5} \qquad \frac{v}{10} = \frac{3}{5}$$
$$5m = (2)(10) \qquad 5v = (3)(10)$$
$$5m = 20 \qquad 5v = 30$$
$$\left(\frac{1}{5}\right)5m = 20\left(\frac{1}{5}\right) \qquad \left(\frac{1}{5}\right)5v = 30\left(\frac{1}{5}\right)$$
$$m = 4 \qquad v = 6$$
$$10 - 4 = 6 \qquad 10 - 6 = 4$$

Natalee saw 4 Monarch butterflies and 6 Viceroy butterflies on the plant.