

## Practice

- Describe two ways the numbers in each proportion are related.  
a)  $5:20 = 125:500$     b)  $10:1 = 120:12$     c)  $75:25 = 300:100$     d)  $1:3 = 16:48$
- Multiply between ratios to determine each value of  $n$ .  
a)  $2:5 = 8:n$     b)  $2:n = 6:9$     c)  $n:5 = 12:20$     d)  $8:n = 4:15$
- Multiply within ratios to determine each value of  $z$ .  
a)  $4:8 = 3:z$     b)  $5:z = 6:18$     c)  $z:14 = 10:20$     d)  $3:21 = z:56$
- A portable music player with 4 GB of memory stores about 1000 songs.  
A music player with 60 GB of memory stores about 15 000 songs.  
Is the number of songs proportional to the amount of memory?  
Explain your reasoning.
- To make green paint, 3 parts yellow paint are mixed with 2 parts blue paint.  
Janis has 12 L of blue paint. How much yellow paint does she need? Explain.
- Ali earned \$80 working 10 h.  
How long would it take him to earn \$200? Explain how you found your answer.
- A recipe that serves 4 people uses 3 potatoes.  
How many potatoes are needed to serve 20 people?

### Need Help?

Read Connect the Ideas.



Sometimes, it is helpful to simplify one of the ratios in a proportion.

### Example

Determine the value of  $c$ .

$$c:20 = 18:15$$

### Solution

$$c:20 = 18:15$$

We cannot immediately identify how the terms are related.

$$c:20 = 18:15$$

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Use mental math to determine an equivalent ratio for 18:15.

Divide each term by 3.

$$18:15 = \frac{18}{3}:\frac{15}{3}$$

$$= 6:5$$

$$\text{So, } c:20 = 6:5$$

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$$\div 4$$

Since  $20 \div 4 = 5$ , then  $c \div 4 = 6$

$$\text{So, } c = 24$$

8. Determine the value of each variable.

a)  $4:10 = 18:c$

b)  $125:25 = n:6$

c)  $6:y = 9:12$

d)  $60:z = 24:6$

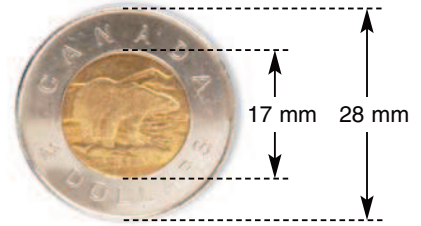
9. **Assessment Focus** In 1996, the Royal Canadian Mint issued the new \$2 coin.

a) A poster advertising the new coin showed a large photograph of the toonie.

The diameter of the inner core on the poster was 51 cm. What was the outer diameter of the coin on the poster? Show your work.

b) Did you solve the problem using a proportion?

How could you solve it without using a proportion?



10. When a robin flies, it beats its wings about 23 times in 10 s.

How many times will it beat its wings in 2 min?

Explain your thinking.

11. A gear ratio is the ratio of the numbers of teeth in two connected gears.

The gear ratio of two gears is 3:2.

a) The larger gear has 126 teeth.

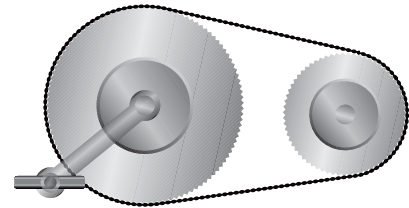
How many teeth does the smaller gear have?

How did you solve the problem?

b) Suppose the smaller gear has 126 teeth.

How many teeth would the larger gear have? Explain.

Show your work.



12. **Take It Further** There are 900 students enrolled in Mount Forest Secondary School.

The ratio of girls to boys is 5:4.

a) How many boys and how many girls go to Mount Forest SS?

Explain how you found your answer.

b) The average class size is 27 students.

Suppose this class is representative of all the students in the school.

How many students in this class are girls?

How many are boys?

### In Your Own Words

Use one of the questions in this section.

Explain how you can use a proportion to answer the question.