

# Solutions

1. In your class, what is the ratio of the numbers of
- a) boys to girls?
  - b) girls to students?

$$a) \quad 7 : 11$$

$$b) \quad 11 : 18$$

2. Consider this classification of the days of the week.

Bad days: Monday, Tuesday, Wednesday

Good days: Thursday, Friday

Excellent days: Saturday, Sunday

a) Write a ratio to compare the number of excellent days to the number of bad days.

$$2 : 3$$

b) Write a ratio to compare the number of excellent days to the number of days in a week.

$$2 : 7$$

c) How can you determine the number of good days in a year?

d) Describe some factors that might affect the way the days are classified.

$$c) 2 \times 52 \text{ (weeks in a year)} \\ = 104 \text{ excellent days}$$

d) School/work days at the beginning of the week = bad  
 " " " = good  
 end " " = good  
 weekend = excellent

3. Look at the beads.

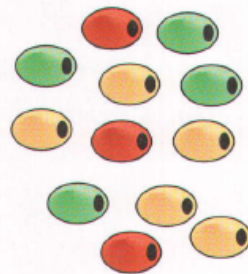
Explain what each ratio represents.

a) 3:4

b) 5:4

c) 5:12

d) 1:3



a) red : green

b) yellow : green

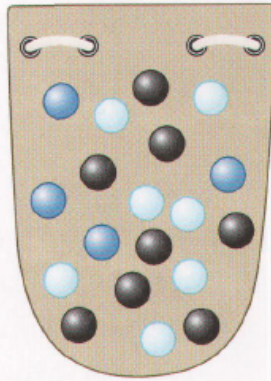
c) yellow : total

d) green : total

$$\left[ \begin{array}{l} 4 : 12 \\ \div 4 \downarrow \\ 1 : 3 \end{array} \right] \div 4$$

4. Look at the bag of marbles.

Draw a diagram to represent each ratio.  
Then, use numbers to write each ratio in simplest form.



- a) blue marbles:white marbles  
b) black marbles:blue marbles  
c) white marbles:total number of marbles

$$\text{a) blue : white} \\ 4 : 7$$

$$\text{b) black : blue} \\ 8 : 4 \quad \downarrow \div 4 \\ \div 4 \quad \downarrow \quad 2 : 1$$

$$\text{c) white : total} \\ 7 : 19$$

5. Write each ratio in simplest form.

- a) 5:10                      b) 18:6  
c) 14:35                     d) 120:50

$$\text{a) } 5 : 10 \quad \downarrow \div 5 \\ \div 5 \quad \downarrow \quad 1 : 2$$

$$\text{b) } 18 : 6 \quad \downarrow \div 6 \\ \div 6 \quad \downarrow \quad 3 : 1$$

$$\text{c) } 14 : 35 \quad \downarrow \div 7 \\ \div 7 \quad \downarrow \quad 2 : 5$$

$$\text{d) } 120 : 50 \quad \downarrow \div 10 \\ \div 10 \quad \downarrow \quad 12 : 5$$

6. What is the missing number in each proportion?

a)  $\frac{4}{7} = \frac{\square}{14}$

b)  $\frac{\square}{5} = \frac{12}{15}$

c)  $\frac{16}{36} = \frac{4}{\square}$

d)  $\frac{2}{3} = \frac{\square}{15}$

a)  $\frac{4}{7} = \frac{x}{14}$   
 $\times 2$   
 $x = 4 \times 2$   
 $x = 8$

c)  $\frac{16}{36} = \frac{4}{x}$   
 $\div 4$   
 $x = 16 \div 4$   
 $x = 4$

d)  $\frac{2}{3} = \frac{x}{15}$   
 $\times 5$   
 $x = 2 \times 5$   
 $x = 10$

b)  $\frac{x}{5} = \frac{12}{15}$   
 $\div 3$   
 $x = 12 \div 3$   
 $x = 4$

7. Find the missing number in each proportion.

a)  $1:6 = \square:54$

b)  $6:8 = 3:\square$

c)  $5:20 = \square:4$

d)  $\square:4 = 8:16$

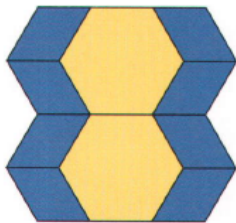
a)  $1:6 = x:54$   
 $\times 9$   
 $x = 1 \times 9$   
 $x = 9$

b)  $6:8 = 3:x$   
 $\div 2$   
 $x = 8 \div 2$   
 $x = 4$

c)  $5:20 = x:4$   
 $\div 5$   
 $x = 5 \div 5$   
 $x = 1$

d)  $x:4 = 8:16$   
 $\div 4$   
 $x = 8 \div 4$   
 $x = 2$

8. Look at the shape pattern. The pattern has 10 blocks in total.



- a) Use a ratio to compare the number of yellow blocks to the total number of blocks. Write the ratio in simplest form.

$$\begin{aligned} & \text{a) yellow : total} \\ & \div 2 \left( \begin{array}{l} 2 : 8 \\ 1 : 4 \end{array} \right) \div 2 \end{aligned}$$

- b) How are the numbers of yellow blocks and blue blocks related?  
c) Would your answer to part b) change if the pattern were repeated so it had a total of 50 blocks? Explain your reasoning.

$$\begin{aligned} & \text{b) blue} = \text{yellow} \times 4 \\ & \text{c) No, because the ratio stays the same} \end{aligned}$$

9. Tami makes her own oil and vinegar dressing. Her recipe calls for 150 mL of olive oil and 200 mL of vinegar.

- a) Write a ratio, in simplest form, to compare the amounts of the two ingredients.

$$\begin{aligned} & \text{a) olive : vinegar} \\ & \text{oil} \\ & \div 50 \left( \begin{array}{l} 150 : 200 \\ 3 : 4 \end{array} \right) \div 50 \end{aligned}$$

$$\text{c) } \frac{\text{olive}}{\text{total}}$$

$$\frac{x}{700} = \frac{3}{7}$$

$$x = \frac{3}{7} \times 700$$

$$x = 300 \text{ ml of olive oil}$$

- b) What amount of vinegar is needed to mix with 270 mL of olive oil?

- c) If Tami wants to make 700 mL of the dressing, what quantity of each  $\frac{\text{vinegar}}{\text{olive oil}}$  ingredient does she need?

$$\text{b) } \frac{x}{270} = \frac{200}{150}$$

$$x = \frac{200}{150} \times 270$$

$$x = 360 \text{ ml}$$

$$\frac{\text{vinegar}}{\text{total}}$$

$$\frac{x}{700} = \frac{4}{7}$$

$$x = \frac{4}{7} \times 700$$

$$x = 400 \text{ ml of vinegar}$$

10. A recipe for two-cheese lasagna calls for 200 g of ricotta and 300 g of mozzarella.



- a) Write a ratio, in simplest form, to compare the amounts of the two cheeses.

a) ricotta : mozzarella  
 $200 : 300 \downarrow \div 100$   
 $\div 100 \quad 2 : 3$

c) 1 kg = 1000g (total)

$$\frac{\text{mozzarella}}{\text{total}}$$

$$\frac{x}{1000} = \frac{3}{5}$$

$$x = \frac{3}{5} \times 1000$$

$$x = 600\text{g of mozzarella}$$

- b) What amount of mozzarella is needed to make a lasagna that contains 800 g of ricotta?

- c) What amount of each cheese is needed to make a lasagna that contains 1 kg of cheese in total?

b)  $\frac{\text{mozzarella}}{\text{ricotta}}$   
 $\frac{x}{800} = \frac{3}{2}$   
 $x = \frac{3}{2} \times 800$   
 $x = 1200\text{g of mozzarella}$

$$\frac{\text{ricotta}}{\text{total}}$$

$$\frac{x}{1000} = \frac{2}{5}$$

$$x = \frac{2}{5} \times 1000$$

$$x = 400\text{g of ricotta}$$

11. A baseball team's win-loss record is 20:15.

- a) Write this ratio in simplest form. Explain what this ratio tells you.  
 b) If this trend continues, how many losses would you expect the team to have once they have won 60 games?  
 c) Approximately how many games would you expect the team to win over a 161-game season?

b)  $4 : 3 \downarrow \times 15$   
 $\times 15 \downarrow 60 : 45$   
 I would expect them to have lost 45 games.

a)  $20 : 15 \downarrow \div 5$   
 $\div 5 \downarrow 4 : 3 \downarrow \div 5$   
 For every 4 games that they win, they lose 3 games.

c)  $\frac{\text{wins}}{\text{total}}$   
 $\frac{x}{161} = \frac{4}{7}$   
 $x = \frac{4}{7} \times 161$   
 $x = 92$

12. At a soccer tournament, one team's win-loss record was 12:8. A second team had a win-loss record of 15:5. Both teams had no ties.

- Express each ratio in simplest form.
- How many games did each team play?
- Explain how you solved parts a) and b).

b) 1<sup>ST</sup> team  
 Total = 12 + 8  
 games = 20 games

2<sup>ND</sup> team  
 Total = 15 + 5  
 games = 20 games

a) 1<sup>ST</sup> team  
 $\div 4 \left( \begin{array}{l} 12:8 \\ 3:2 \end{array} \right) \div 4$

2<sup>ND</sup> team

$\div 5 \left( \begin{array}{l} 15:5 \\ 3:1 \end{array} \right) \div 5$

c) Find common factors for both ratios in (a)  
 Find total parts in (b)

13. Look at Example 2, part b). What other way can you calculate the amount of orange juice, once you know the amount of raspberry juice?

- Show your calculation.
- Explain why this method works.

USE either a ratio or a proportion statement.