Year 8 ratios worksheet

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Name: _____ Date: _____

Question 1

Simplify the ratio 45 : 60.

Answer: _____

Question 2

Concrete is made by mixing cement, sand and gravel in the ratio 1 : 2 : 3 by mass.

(a) How much of each ingredient is needed for 240 kg of concrete mix?

(b) A builder has 50 kg of cement. How much gravel is needed to use all the cement?

Answer: _____

Question 3

Orange juice is sold in two sizes. A 600 mL bottle costs $3.00 and a 1.5 L bottle costs $6.60. Which size is the better buy?

Answer: _____

Question 4

Simplify the ratio 2.4 : 0.6.

Answer: _____

Question 5

In a jar, the ratio of red jelly beans to green jelly beans is 3 : 5. There are 24 red jelly beans. How many green jelly beans are there?

Answer: _____

Question 6

A 750 g box of cereal costs $4.50 and a 1.2 kg box of the same cereal costs $6.96. Which box is better value? Give the unit price of the **better-value** box in cents per 100 g. Give your answer in cents per 100 g, correct to 1 decimal place.

Answer: _____

Question 7

Simplify the ratio ⅔ : ⅚.

Answer: _____

Question 8

Share $60 between Ella and Noah in the ratio 2 : 3.

Answer: _____

Question 9

Two brands of rice are on sale. Brand A comes in a 2 kg bag for $5.60. Brand B comes in a 750 g bag for $2.25. Which brand is the better buy? Show your working.

Answer: _____

Question 10

Simplify the ratio 75 cm : 3 m.

Answer: _____

Year 8 ratios: answers and worked solutions

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Question 1

Key idea: Divide both parts of the ratio by their highest common factor.

1. The HCF of 45 and 60 is 15 2. 45 ÷ 15 : 60 ÷ 15 = 3 : 4

Answer: 3 : 4

Question 2

Key idea: Add the parts of the ratio to find the total number of parts, then find the value of one part.

1. (a) Total parts: 1 + 2 + 3 = 6, and one part = 240 ÷ 6 = 40 kg 2. (a) Cement 1 × 40 = 40 kg, sand 2 × 40 = 80 kg, gravel 3 × 40 = 120 kg 3. (b) One part = 50 kg (the cement), so gravel = 3 × 50 = 150 kg

Answer: (a) Cement 40 kg, sand 80 kg, gravel 120 kg (b) 150 kg

Question 3

Key idea: Convert both options to the same unit, then find the cost per millilitre (unit price) for each. The lower unit price is the better buy.

1. Convert 1.5 L to millilitres: 1.5 L = 1500 mL 2. Unit price of the 600 mL bottle: 300/600 = 0.50 cents/mL 3. Unit price of the 1500 mL bottle: 660/1500 = 0.44 cents/mL 4. Compare: 0.44 < 0.50, so the 1.5 L bottle has the lower unit price.

Answer: The 1.5 L bottle is the better buy at 0.44 cents/mL.

Question 4

Key idea: Multiply both parts by a power of 10 to remove the decimals, then simplify.

1. Multiply both parts by 10: 24 : 6 2. Divide both parts by 6: 4 : 1

Answer: 4 : 1

Question 5

Key idea: Find the value of one part, then multiply by the number of parts needed.

1. 3 parts = 24, so 1 part = 24 ÷ 3 = 8. 2. Green is 5 parts: 5 × 8 = 40.

Answer: 40

Question 6

Key idea: Convert each price to the same unit rate (cents per 100 g) and compare.

1. Convert prices to cents: $4.50 = 450 c and $6.96 = 696 c. 2. Find the unit price for the 750 g box: 450/750 × 100 = 60.0 c per 100 g 3. Find the unit price for the 1.2 kg box. Convert 1.2 kg to grams: 1.2 kg = 1200 g. 696/1200 × 100 = 58.0 c per 100 g 4. Compare: 58.0 < 60.0, so the 1.2 kg box is better value (cheaper per gram).

Answer: 58.0 cents per 100 g

Question 7

Key idea: Multiply both parts by the lowest common denominator to give whole numbers.

1. The LCD of 3 and 6 is 6 2. ⅔ × 6 : ⅚ × 6 = 4 : 5

Answer: 4 : 5

Question 8

Answer: Ella $24, Noah $36

Question 9

Key idea: Find the price per 100 g for each brand, then compare.

1. Convert Brand A to grams: 2 kg = 2000 g 2. Price per 100 g for Brand A: 560/2000 × 100 = 28 cents per 100 g 3. Price per 100 g for Brand B: 225/750 × 100 = 30 cents per 100 g 4. Compare: 28 < 30, so Brand A is cheaper per 100 g.

Answer: Brand A is the better buy at 28 cents/100 g.

Question 10

Key idea: Both parts of a ratio must be in the same unit before simplifying.

1. 3 m = 300 cm, so the ratio is 75 : 300 2. Divide both parts by 75: 1 : 4

Answer: 1 : 4