

Collegedunia NCERT Solutions

Class 8 Mathematics (Part 1)

Chapter 7: Proportional Reasoning-1

Updated for the 2026-27 NCERT textbook

Also see

[Chapter 7 NCERT Book PDF](#) [Chapter 7 Notes](#) [Chapter 7 Handwritten Notes](#)

What this PDF covers

This PDF gives answers for Class 8 Maths Part 1 Chapter 7.

It covers ratios, proportion, cross multiplication, sharing in a ratio and unit conversion.

It also explains why same addition or same subtraction does not always preserve a ratio.

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Question

Circle the statements of proportion that are true: (i) $4 : 7 :: 12 : 21$, (ii) $8 : 3 :: 24 : 6$, (iii) $7 : 12 :: 12 : 7$, (iv) $21 : 6 :: 35 : 10$, (v) $12 : 18 :: 28 : 12$, (vi) $24 : 8 :: 9 : 3$.

SOLUTION

Concept used. Use cross multiplication for each pair. A statement $a : b :: c : d$ is true when $a \times d = b \times c$.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. (i) $4 \times 21 = 84$ and $7 \times 12 = 84$, so it is true.
2. (ii) $8 \times 6 = 48$ and $3 \times 24 = 72$, so it is false.
3. (iii) $7 \times 7 = 49$ and $12 \times 12 = 144$, so it is false.
4. (iv) $21 \times 10 = 210$ and $6 \times 35 = 210$, so it is true.
5. (v) $12 \times 12 = 144$ and $18 \times 28 = 504$, so it is false.
6. (vi) $24 \times 3 = 72$ and $8 \times 9 = 72$, so it is true.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

The true statements are (i), (iv), and (vi).

Strategic observation. Use cross multiplication for each pair. A statement $a : b :: c : d$ is true when $a \times d = b \times c$.

1. (i) $4 \times 21 = 84$ and $7 \times 12 = 84$, so it is true.
2. (ii) $8 \times 6 = 48$ and $3 \times 24 = 72$, so it is false.
3. (iii) $7 \times 7 = 49$ and $12 \times 12 = 144$, so it is false.
4. (iv) $21 \times 10 = 210$ and $6 \times 35 = 210$, so it is true.
5. (v) $12 \times 12 = 144$ and $18 \times 28 = 504$, so it is false.
6. (vi) $24 \times 3 = 72$ and $8 \times 9 = 72$, so it is true.

Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

The true statements are (i), (iv), and (vi).

Question

Give 3 ratios that are proportional to 4 : 9.

SOLUTION

Concept used. Multiply both terms of 4 : 9 by the same number.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. Multiply by 2 to get 8 : 18.
2. Multiply by 3 to get 12 : 27.
3. Multiply by 5 to get 20 : 45.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

Three possible ratios are 8 : 18, 12 : 27, and 20 : 45.

EXPERT SOLUTION: Kabir Menon, M.Sc Mathematics, IIT Madras

Strategic observation. Multiply both terms of 4 : 9 by the same number.

1. Multiply by 2 to get 8 : 18.
2. Multiply by 3 to get 12 : 27.
3. Multiply by 5 to get 20 : 45.

Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

Three possible ratios are 8 : 18, 12 : 27, and 20 : 45.

Question

Fill in the missing numbers for ratios proportional to 18 : 24: 3 : blank, 12 : blank, 20 : blank, 27 : blank.

SOLUTION

Concept used. First reduce 18 : 24 to 3 : 4. Equivalent ratios have the same multiplier on both terms.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. For first term 3, divide 18 by 6, so divide 24 by 6 to get 4.
2. For first term 12, multiply 18 by $\frac{2}{3}$, so $24 \times \frac{2}{3} = 16$.
3. For first term 20, multiply 18 by $\frac{10}{9}$, so $24 \times \frac{10}{9} = 80/3$.
4. For first term 27, multiply 18 by $\frac{3}{2}$, so $24 \times \frac{3}{2} = 36$.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

The completed ratios are 3 : 4, 12 : 16, 20 : $80/3$, and 27 : 36.

EXPERT SOLUTION: Aditi Rao, B.Ed Mathematics, University of Mumbai

Strategic observation. First reduce 18 : 24 to 3 : 4. Equivalent ratios have the same multiplier on both terms.

1. For first term 3, divide 18 by 6, so divide 24 by 6 to get 4.
2. For first term 12, multiply 18 by $\frac{2}{3}$, so $24 \times \frac{2}{3} = 16$.
3. For first term 20, multiply 18 by $\frac{10}{9}$, so $24 \times \frac{10}{9} = 80/3$.
4. For first term 27, multiply 18 by $\frac{3}{2}$, so $24 \times \frac{3}{2} = 36$.

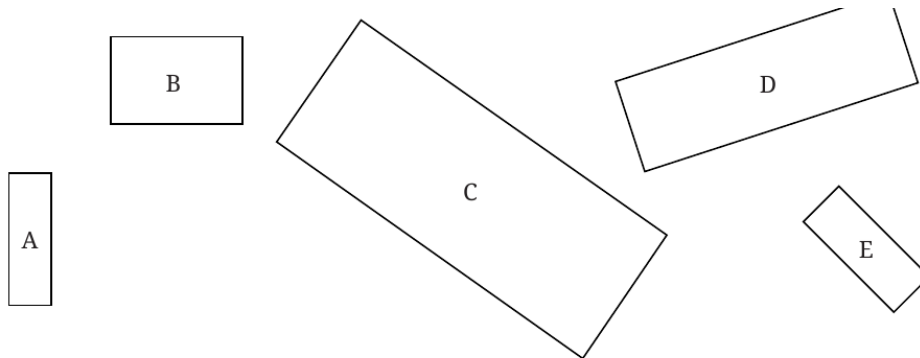
Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

The completed ratios are 3 : 4, 12 : 16, 20 : $80/3$, and 27 : 36.

Question

Which of the shown rectangles are similar to each other?



SOLUTION

Concept used. Rectangles are similar when their width to height ratios are equal after allowing rotation.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. Measure each rectangle or compare long side : short side.
2. Rectangles A and D have nearly the same long-side to short-side ratio, about 3 : 1, after allowing rotation.
3. Rectangles C and E have nearly the same long-side to short-side ratio, about 5 : 2, after allowing rotation.
4. Rectangle B has a different side ratio from these two pairs.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

The similar pairs are A and D, and C and E.

EXPERT SOLUTION: Pranav Iyer, M.Sc Mathematics, IISc Bengaluru

Strategic observation. Rectangles are similar when their width to height ratios are equal after allowing rotation.

1. Measure each rectangle or compare long side : short side.
2. Rectangles A and D have nearly the same long-side to short-side ratio, about 3 : 1, after allowing rotation.
3. Rectangles C and E have nearly the same long-side to short-side ratio, about 5 : 2, after allowing rotation.

4. Rectangle B has a different side ratio from these two pairs.

Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

The similar pairs are A and D, and C and E.

Question

Draw a smaller rectangle and a bigger rectangle with the same width to height ratio as the given rectangle. Are all classmates' drawings the same?



SOLUTION

Concept used. Equivalent ratios can have many different sizes.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. Suppose the given rectangle has width : height = $w : h$.
2. A smaller similar rectangle can have dimensions $w/2$ and $h/2$.
3. A bigger similar rectangle can have dimensions $2w$ and $2h$.
4. Classmates may draw different sizes, but the drawings are correct if the width and height are multiplied by the same factor.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

They need not be the same size. They are correct when the width : height ratio stays the same.

Strategic observation. Equivalent ratios can have many different sizes.

1. Suppose the given rectangle has width : height = $w : h$.
2. A smaller similar rectangle can have dimensions $w/2$ and $h/2$.
3. A bigger similar rectangle can have dimensions $2w$ and $2h$.
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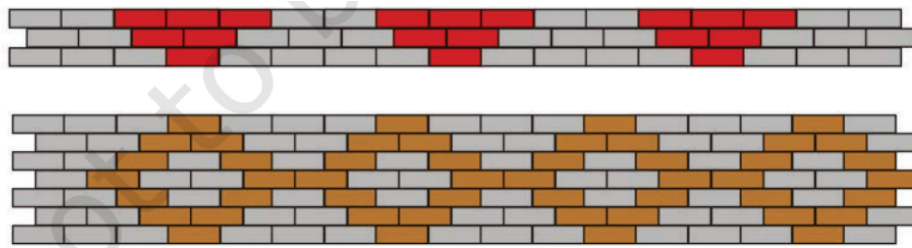
Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

They need not be the same size. They are correct when the width : height ratio stays the same.

Question

For the two brick-wall patterns, find the ratio of grey bricks to coloured bricks in simplest form.



SOLUTION

Concept used. Count one repeating block of the wall because the pattern continues.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. In pattern (a), one repeating block has 9 grey bricks and 6 coloured bricks, so the ratio is $9 : 6 = 3 : 2$.
2. In pattern (b), one repeating block has 16 grey bricks and 12 coloured bricks, so the ratio is $16 : 12 = 4 : 3$.
3. Using a repeating block works because every block repeats with the same counts.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

Pattern (a) is $3 : 2$. Pattern (b) is $4 : 3$.

EXPERT SOLUTION: Ananya Sen, M.Sc Mathematics, Presidency University

Strategic observation. Count one repeating block of the wall because the pattern continues.

1. In pattern (a), one repeating block has 9 grey bricks and 6 coloured bricks, so the ratio is $9 : 6 = 3 : 2$.
2. In pattern (b), one repeating block has 16 grey bricks and 12 coloured bricks, so the ratio is $16 : 12 = 4 : 3$.
3. Using a repeating block works because every block repeats with the same counts.

Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

Pattern (a) is 3 : 2. Pattern (b) is 4 : 3.

Question

Measure a friend's head, torso, arms and legs. Write head : torso, torso : arms, torso : legs, then draw a figure with equivalent ratios.

SOLUTION

Concept used. This is an activity question, so the exact numbers depend on the measurements taken.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. Measure all lengths using the same unit.
2. Reduce each ratio to its simplest form.
3. Choose a drawing scale such as 1 cm in the drawing for 10 cm on the body.
4. Multiply every body-part length by the same scale factor before drawing.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

The drawing looks realistic when all body-part ratios are kept proportional.

EXPERT SOLUTION: Rahul Nair, B.Ed Mathematics, University of Calicut

Strategic observation. This is an activity question, so the exact numbers depend on the measurements taken.

1. Measure all lengths using the same unit.
2. Reduce each ratio to its simplest form.
3. Choose a drawing scale such as 1 cm in the drawing for 10 cm on the body.
4. Multiply every body-part length by the same scale factor before drawing.

Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

The drawing looks realistic when all body-part ratios are kept proportional.

Question

The Earth travels about 940 million kilometres around the Sun in a year. How many kilometres will it travel in a week?

SOLUTION

Concept used. Assume 1 year = 52 weeks.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. Distance in 52 weeks = 940 million km.
2. Distance in 1 week = $940/52$ million km.
3. $940/52 = 235/13 = 18.0769$ approximately.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

About 18.08 million kilometres in a week.

EXPERT SOLUTION: Nisha Kapoor, M.Sc Applied Mathematics, Panjab University

Strategic observation. Assume 1 year = 52 weeks.

1. Distance in 52 weeks = 940 million km.
2. Distance in 1 week = $940/52$ million km.
3. $940/52 = 235/13 = 18.0769$ approximately.

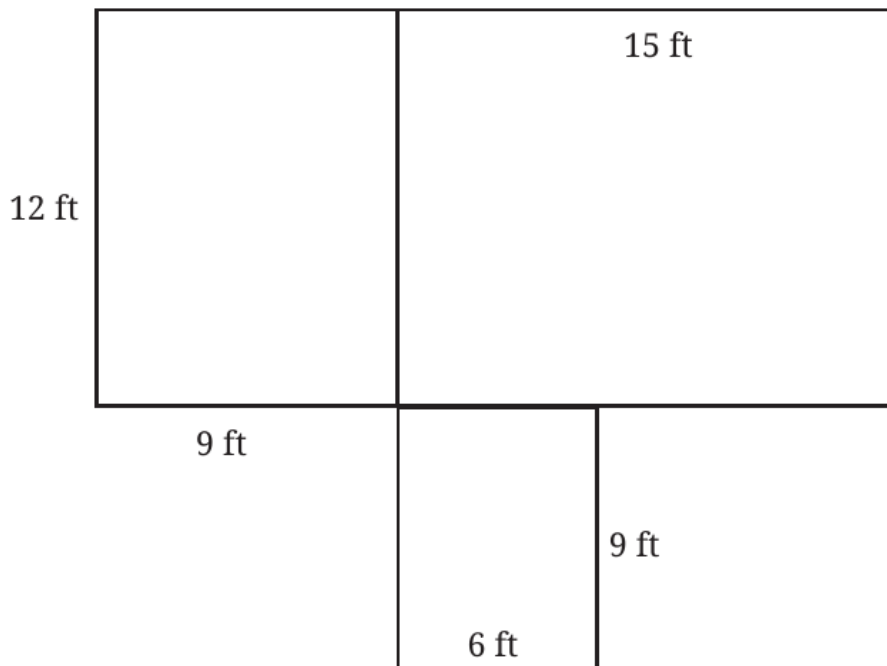
Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

About 18.08 million kilometres in a week.

Question

A mason needs 1450 bricks for 10 feet of wall. Find the bricks needed for the shown house walls.



SOLUTION

Concept used. Add the outer walls and the inner wall from the diagram, then scale by bricks per 10 feet.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. Add every outside wall segment and the inner wall shown in the diagram.
2. Total wall length = $12 + 12 + 12 + 15 + 9 + 15 + 9 + 9 + 9 + 6 = 108$ ft.
3. 1450 bricks are needed for 10 ft, so bricks for 108 ft = $1450 \times 108/10$.
4. $1450 \times 10.8 = 15660$.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

The mason needs approximately 15,660 bricks.

Strategic observation. Add the outer walls and the inner wall from the diagram, then scale by bricks per 10 feet.

1. Add every outside wall segment and the inner wall shown in the diagram.
2. Total wall length = $12 + 12 + 12 + 15 + 9 + 15 + 9 + 9 + 9 + 6 = 108$ ft.
3. 1450 bricks are needed for 10 ft, so bricks for 108 ft = $1450 \times 108/10$.
4. $1450 \times 10.8 = 15660$.

Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

The mason needs approximately 15,660 bricks.

Question

Divide Rs. 4,500 into two parts in the ratio 2 : 3.

SOLUTION

Concept used. For ratio 2 : 3, the total number of parts is 5.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. One part = $4500/5 = 900$.
2. First share = $2 \times 900 = 1800$.
3. Second share = $3 \times 900 = 2700$.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

The two parts are Rs. 1,800 and Rs. 2,700.

EXPERT SOLUTION: Arjun Mehta, B.Ed Mathematics, Gujarat University

Strategic observation. For ratio 2 : 3, the total number of parts is 5.

1. One part = $4500/5 = 900$.
2. First share = $2 \times 900 = 1800$.
3. Second share = $3 \times 900 = 2700$.

Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

The two parts are Rs. 1,800 and Rs. 2,700.

Question

Acid and water are mixed in the ratio 1 : 5. In 240 mL of solution, how much acid and water are present?

SOLUTION

Concept used. Total parts = $1 + 5 = 6$.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. One part = $240/6 = 40$ mL.
2. Acid = $1 \times 40 = 40$ mL.
3. Water = $5 \times 40 = 200$ mL.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

The solution contains 40 mL acid and 200 mL water.

EXPERT SOLUTION: Sara Thomas, M.Sc Mathematics, Christ University

Strategic observation. Total parts = $1 + 5 = 6$.

1. One part = $240/6 = 40$ mL.
2. Acid = $1 \times 40 = 40$ mL.
3. Water = $5 \times 40 = 200$ mL.

Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

The solution contains 40 mL acid and 200 mL water.

Question

Blue and yellow paints are mixed in the ratio 3 : 5 to make 40 mL green paint. Find each amount. Then add 20 mL yellow and find the new ratio.

SOLUTION

Concept used. Divide 40 mL into 8 parts first.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. One part = $40/8 = 5$ mL.
2. Blue = $3 \times 5 = 15$ mL.
3. Yellow = $5 \times 5 = 25$ mL.
4. After adding 20 mL yellow, yellow becomes 45 mL.
5. New ratio blue : yellow = $15 : 45 = 1 : 3$.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

Blue = 15 mL, yellow = 25 mL. The new ratio is 1 : 3.

EXPERT SOLUTION: Vikram Sethi, M.Sc Mathematics, Kurukshetra University

Strategic observation. Divide 40 mL into 8 parts first.

1. One part = $40/8 = 5$ mL.
2. Blue = $3 \times 5 = 15$ mL.
3. Yellow = $5 \times 5 = 25$ mL.
4. After adding 20 mL yellow, yellow becomes 45 mL.
5. New ratio blue : yellow = $15 : 45 = 1 : 3$.

Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

Blue = 15 mL, yellow = 25 mL. The new ratio is 1 : 3.

Question

Rice and urad dal are mixed in the ratio 2 : 1. For 6 cups of mixture, how many cups of each are needed?

SOLUTION

Concept used. Total parts = 3.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. One part = $6/3 = 2$ cups.
2. Rice = $2 \times 2 = 4$ cups.
3. Urad dal = $1 \times 2 = 2$ cups.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

Use 4 cups rice and 2 cups urad dal.

EXPERT SOLUTION: Ishita Banerjee, B.Sc Mathematics, Calcutta University

Strategic observation. Total parts = 3.

1. One part = $6/3 = 2$ cups.
2. Rice = $2 \times 2 = 4$ cups.
3. Urad dal = $1 \times 2 = 2$ cups.

Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

Use 4 cups rice and 2 cups urad dal.

Question

Orange paint is made by mixing red and yellow paints in the ratio 3 : 5. Another bucket of yellow is added. Find the new ratio of red to yellow.

SOLUTION

Concept used. Treat one bucket of orange paint as 8 equal parts.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. In one bucket, red = 3 parts and yellow = 5 parts.
2. One full bucket has 8 such parts.
3. Adding one bucket of yellow adds 8 parts of yellow.
4. New red : yellow = 3 : (5 + 8) = 3 : 13.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

The new ratio of red paint to yellow paint is 3 : 13.

EXPERT SOLUTION: Manav Verma, M.Sc Mathematics, University of Rajasthan

Strategic observation. Treat one bucket of orange paint as 8 equal parts.

1. In one bucket, red = 3 parts and yellow = 5 parts.
2. One full bucket has 8 such parts.
3. Adding one bucket of yellow adds 8 parts of yellow.
4. New red : yellow = 3 : (5 + 8) = 3 : 13.

Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

The new ratio of red paint to yellow paint is 3 : 13.

Question

Anagh mixes 600 mL orange juice with 900 mL apple juice. Write the ratio of orange juice to apple juice in simplest form.

SOLUTION

Concept used. Divide both terms by their HCF.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. The ratio is 600 : 900.
2. The HCF of 600 and 900 is 300.
3. $600/300 : 900/300 = 2 : 3$.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

The simplest ratio is 2 : 3.

EXPERT SOLUTION: Pooja Kulkarni, B.Ed Mathematics, Savitribai Phule Pune University

Strategic observation. Divide both terms by their HCF.

1. The ratio is 600 : 900.
2. The HCF of 600 and 900 is 300.
3. $600/300 : 900/300 = 2 : 3$.

Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

The simplest ratio is 2 : 3.

Question

Last year 3 full buses carried 162 students and teachers. This year there are 204 students. How many buses are needed? Will all buses be full?

SOLUTION

Concept used. Find the capacity of one bus first.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. Capacity of one bus = $162/3 = 54$ people.
2. For 204 people, $204/54 = 3$ remainder 42.
3. So 3 buses are not enough, and 4 buses are needed.
4. The fourth bus will carry 42 people, so all buses will not be full.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

They need 4 buses. All buses will not be full.

EXPERT SOLUTION: Harshita Jain, M.Sc Applied Mathematics, Amity University

Strategic observation. Find the capacity of one bus first.

1. Capacity of one bus = $162/3 = 54$ people.
2. For 204 people, $204/54 = 3$ remainder 42.
3. So 3 buses are not enough, and 4 buses are needed.
4. The fourth bus will carry 42 people, so all buses will not be full.

Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

They need 4 buses. All buses will not be full.

Question

Delhi has area 1,484 sq. km and population 30 million. Mumbai has area 550 sq. km and population 20 million. Which city is more crowded?

SOLUTION

Concept used. Compare population density, population divided by area.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. Delhi density = $30,000,000/1,484$ approximately 20,216 people per sq. km.
2. Mumbai density = $20,000,000/550$ approximately 36,364 people per sq. km.
3. Mumbai has the larger density.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

Mumbai is more crowded.

EXPERT SOLUTION: Neel Shah, B.Sc Mathematics, St. Xavier's College

Strategic observation. Compare population density, population divided by area.

1. Delhi density = $30,000,000/1,484$ approximately 20,216 people per sq. km.
2. Mumbai density = $20,000,000/550$ approximately 36,364 people per sq. km.
3. Mumbai has the larger density.

Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

Mumbai is more crowded.

Question

A crane of height 155 cm has neck and rest of body in the ratio 4 : 6. For your height, if the same ratio held, how tall would your neck be?

SOLUTION

Concept used. The neck is 4 out of 10 total parts.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. Let your height be H cm.
2. Neck length = $4/(4 + 6) \times H$.
3. So neck length = $4H/10 = 2H/5$.
4. For example, if $H = 150$ cm, neck length = 60 cm.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

Your neck would be $2/5$ of your height.

EXPERT SOLUTION: Tanya Bose, M.Sc Mathematics, Jadavpur University

Strategic observation. The neck is 4 out of 10 total parts.

1. Let your height be H cm.
2. Neck length = $4/(4 + 6) \times H$.
3. So neck length = $4H/10 = 2H/5$.
4. For example, if $H = 150$ cm, neck length = 60 cm.

Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

Your neck would be $2/5$ of your height.

Question

Lilavati problem: If $2\frac{1}{2}$ palas of saffron cost 37 niskas, what quantity can be bought for 9 niskas?

SOLUTION

Concept used. Quantity is proportional to money paid.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. $2\frac{1}{2}$ palas = $\frac{5}{2}$ palas cost 37 niskas.
2. Let x palas cost 9 niskas.
3. $37 : \frac{5}{2} :: 9 : x$.
4. $x = (\frac{5}{2} \times 9)/37 = 45/74$ palas.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

The quantity is $45/74$ palas, about 0.608 palas.

EXPERT SOLUTION: Aditya Pillai, B.Ed Mathematics, Mahatma Gandhi University

Strategic observation. Quantity is proportional to money paid.

1. $2\frac{1}{2}$ palas = $\frac{5}{2}$ palas cost 37 niskas.
2. Let x palas cost 9 niskas.
3. $37 : \frac{5}{2} :: 9 : x$.
4. $x = (\frac{5}{2} \times 9)/37 = 45/74$ palas.

Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

The quantity is $45/74$ palas, about 0.608 palas.

Question

Harmain is 1 year old and her elder brother is 5 years old. What will Harmain's age be when the ratio of her age to her brother's age is 1 : 2?

SOLUTION

Concept used. The age difference stays 4 years.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. Let Harmain's age be x years then.
2. Her brother's age will be $x + 4$ years.
3. We need $x : (x + 4) = 1 : 2$.
4. $2x = x + 4$, so $x = 4$.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

Harmain will be 4 years old.

EXPERT SOLUTION: Kavya Reddy, M.Sc Mathematics, Osmania University

Strategic observation. The age difference stays 4 years.

1. Let Harmain's age be x years then.
2. Her brother's age will be $x + 4$ years.
3. We need $x : (x + 4) = 1 : 2$.
4. $2x = x + 4$, so $x = 4$.

Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

Harmain will be 4 years old.

Question

The masses of equal volumes of gold and water are in the ratio 37 : 2. If 1 litre of water has mass 1 kg, find the mass of 1 litre of gold.

SOLUTION

Concept used. For equal volumes, gold : water mass = 37 : 2.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. Let the mass of 1 litre gold be x kg.
2. $x : 1 = 37 : 2$.
3. $2x = 37$, so $x = 18.5$.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

The mass of 1 litre of gold is 18.5 kg.

EXPERT SOLUTION: Samar Gupta, B.Sc Mathematics, Banaras Hindu University

Strategic observation. For equal volumes, gold : water mass = 37 : 2.

1. Let the mass of 1 litre gold be x kg.
2. $x : 1 = 37 : 2$.
3. $2x = 37$, so $x = 18.5$.

Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

The mass of 1 litre of gold is 18.5 kg.

Question

A farmer applies 10 tonnes of cow manure for 1 acre. How much manure is needed for a 200 ft by 500 ft plot?

SOLUTION

Concept used. Convert the plot area to acres.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. Area = $200 \times 500 = 100,000$ square feet.
2. 1 acre = 43,560 square feet.
3. Area in acres = $100000/43560$ approximately 2.2957 acres.
4. Manure = $10 \times 2.2957 = 22.957$ tonnes.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

The farmer should buy about 23 tonnes of manure.

EXPERT SOLUTION: Mitali Das, M.Sc Mathematics, Gauhati University

Strategic observation. Convert the plot area to acres.

1. Area = $200 \times 500 = 100,000$ square feet.
2. 1 acre = 43,560 square feet.
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Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

The farmer should buy about 23 tonnes of manure.

Question

A tap fills a 500 mL mug in 15 seconds. How long will it take to fill a 10-litre bucket?

SOLUTION

Concept used. Convert litres to millilitres and scale the time.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. 10 litres = 10,000 mL.
2. $10,000/500 = 20$ mugs.
3. Time = 20×15 seconds = 300 seconds.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

It will take 300 seconds, or 5 minutes.

EXPERT SOLUTION: Yash Malhotra, B.Ed Mathematics, Delhi University

Strategic observation. Convert litres to millilitres and scale the time.

1. 10 litres = 10,000 mL.
2. $10,000/500 = 20$ mugs.
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Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

It will take 300 seconds, or 5 minutes.

Question

One acre of land costs Rs. 15,00,000. What is the cost of 2,400 square feet of the same land?

SOLUTION

Concept used. Use 1 acre = 43,560 square feet.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. Cost per square foot = $15,00,000/43,560$.
2. Cost for 2,400 square feet = $15,00,000 \times 2400/43560$.
3. This equals approximately 82,644.63.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

The cost is about Rs. 82,645.

EXPERT SOLUTION: Priya Menon, M.Sc Statistics, University of Madras

Strategic observation. Use 1 acre = 43,560 square feet.

1. Cost per square foot = $15,00,000/43,560$.
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Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

The cost is about Rs. 82,645.

Question

A pair of oxen takes 6 hours to plough 1 acre. A tractor is 4 times faster. For 20 acres, find the time using oxen and tractor.

SOLUTION

Concept used. Scale the time by area, then divide by 4 for the tractor.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. Oxen time = $20 \times 6 = 120$ hours.
2. The tractor is 4 times faster, so tractor time = $120/4 = 30$ hours.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

Oxen take 120 hours. The tractor takes 30 hours.

EXPERT SOLUTION: Rohan Bhatia, M.Sc Mathematics, Jamia Millia Islamia

Strategic observation. Scale the time by area, then divide by 4 for the tractor.

1. Oxen time = $20 \times 6 = 120$ hours.
2. The tractor is 4 times faster, so tractor time = $120/4 = 30$ hours.

Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

Oxen take 120 hours. The tractor takes 30 hours.

Question

A Rs. 10 coin is cupro-nickel, with copper and nickel in the ratio 3 : 1. The coin mass is 7.74 g. Copper costs Rs. 906 per kg and nickel costs Rs. 1,341 per kg. Find the cost of these metals in one coin.

SOLUTION

Concept used. Divide the coin mass by the metal ratio, then use kg prices.

Source anchor

NCERT Class 8 Ganita Prakash Part 1, Chapter 7: Proportional Reasoning-1, Figure it Out and activity questions.

1. Total parts = 4.
2. Copper mass = $\frac{3}{4} \times 7.74 \text{ g} = 5.805 \text{ g} = 0.005805 \text{ kg}$.
3. Nickel mass = $\frac{1}{4} \times 7.74 \text{ g} = 1.935 \text{ g} = 0.001935 \text{ kg}$.
4. Copper cost = $0.005805 \times 906 = \text{Rs. } 5.25933$.
5. Nickel cost = $0.001935 \times 1341 = \text{Rs. } 2.594835$.
6. Total cost = Rs. 7.854165.

Exam tip

Keep the units the same before comparing ratios. For a proportion $a : b :: c : d$, check $ad = bc$.

Final answer

The metal cost is about Rs. 7.85.

EXPERT SOLUTION: Sneha Iyer, B.Sc Mathematics, Mumbai University

Strategic observation. Divide the coin mass by the metal ratio, then use kg prices.

1. Total parts = 4.
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6. Total cost = Rs. 7.854165.

Expert check. The answer keeps equivalent ratios together and uses the same multiplier or the same cross-product test. This avoids the common mistake of comparing differences instead of factors.

Final answer

The metal cost is about Rs. 7.85.

Related Collegedunia Resources

- [Proportional Reasoning-1 NCERT Book PDF](#)
- [Proportional Reasoning-1 Notes](#)
- [Proportional Reasoning-1 Handwritten Notes](#)

Key Takeaways

- A ratio compares two quantities in order.
- Two ratios are proportional when their simplest forms match, or when cross products are equal.
- Sharing in a ratio starts by finding the total number of parts.
- Unit conversion must happen before setting up a proportion.