CLASS 8 · MATHEMATICS

Proportional Reasoning-1

Sample paper · 15 questions · 22 marks

10 objective questions × 1 mark. Five written-response questions: 12 marks. Write your working where needed. Suggested time: 45 minutes. Answers and marking guidance follow the questions.

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Section A · Objective questions (10 marks)

1. The ratio 12 : 18 in its simplest form is:

A. 2 : 3

B. 4 : 6

C. 6 : 9

D. 3 : 4

2. 3 kg of rice costs 150 rupees. The price per kilogram is:

A. 50 rupees

B. 60 rupees

C. 55 rupees

D. 45 rupees

3. A car travels 180 km in 3 hours at a constant speed. In 5 hours at the same speed it will travel:

A. 240 km

B. 280 km

C. 300 km

D. 320 km

4. If 4 pens cost 60 rupees, then 10 pens cost:

A. 100 rupees

B. 120 rupees

C. 150 rupees

D. 200 rupees

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5. The ratio of 500 m to 2 km, in simplest form, is:

A. 1 : 2

B. 1 : 4

C. 5 : 2

D. 2 : 5

6. A recipe needs 2 cups of flour for 12 cookies. To bake 30 cookies at the same rate, the flour needed is:

A. 6 cups

B. 5 cups

C. 8 cups

D. 4 cups

7. 600 rupees is divided between two children in the ratio 1 : 2. The shares are:

A. 150 and 450 rupees

B. 200 and 400 rupees

C. 250 and 350 rupees

D. 300 and 300 rupees

8. On a map, 1 cm represents 5 km. A road 7 cm long on the map is actually:

A. 35 km

B. 30 km

C. 40 km

D. 25 km

9. Which ratio is equivalent to 4 : 5?

A. 8 : 12

B. 16 : 15

C. 12 : 15

D. 5 : 4

10. A 2 m pole casts a 3 m long shadow. At the same time, a 6 m pole casts a shadow of:

A. 9 m

B. 12 m

C. 6 m

D. 8 m

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Section B · Written responses (12 marks)

Attempt all five. Use a separate sheet if you need more space. The marks for each question are shown.

11. Write the ratio 45 : 75 in its simplest form, showing the step you use. [2 marks]

12. 8 notebooks cost 240 rupees. Using the unitary method, find the cost of 5 notebooks. [2 marks]

13. Share 840 rupees between Asha and Bina in the ratio 3 : 4. How much does each get? [2 marks]

14. A bus covers 240 km in 4 hours at a constant speed. How long will it take to cover 420 km at the same speed? Show your working. [3 marks]

15. A photo 10 cm wide and 15 cm tall is enlarged without distortion so that its width becomes 25 cm. Find its new height, explaining why the height changes in the same ratio. [3 marks]

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Answers & marking guidance

Use these after attempting the paper. Accept equivalent correct reasoning and sensible units. These are Evater model answers, not an official marking scheme.

Section A · 1 mark each

1. A — Dividing both terms by their HCF 6 gives 2 : 3. (6 : 9 and 4 : 6 are equivalent but not simplest.)

2. A — 150 / 3 = 50 rupees per kg.

3. C — Speed is 180 / 3 = 60 km per hour, so in 5 hours it covers 60 x 5 = 300 km.

4. C — One pen costs 60 / 4 = 15 rupees, so 10 pens cost 15 x 10 = 150 rupees.

5. B — 2 km = 2,000 m, and 500 : 2000 = 1 : 4 after dividing by 500.

6. B — 30 cookies is 30 / 12 = 2.5 batches, needing 2 x 2.5 = 5 cups of flour.

7. B — There are 1 + 2 = 3 parts; each part is 600 / 3 = 200 rupees, giving 200 and 400 rupees.

8. A — 7 x 5 = 35 km.

9. C — Multiplying both terms by 3 gives 12 : 15, which is equivalent to 4 : 5.

10. A — At the same time, shadow length is proportional to height: 3 x (6 / 2) = 3 x 3 = 9 m.

Section B · Model answers

11. The HCF of 45 and 75 is 15. Dividing both terms by 15, 45 : 75 = 3 : 5.

Marking: 1 mark for dividing by a common factor (ideally the HCF 15); 1 mark for 3 : 5.

12. One notebook costs 240 / 8 = 30 rupees, so 5 notebooks cost 30 x 5 = 150 rupees.

Marking: 1 mark for the unit price of 30 rupees; 1 mark for 150 rupees.

13. There are 3 + 4 = 7 parts, so each part is 840 / 7 = 120 rupees. Asha gets 3 x 120 = 360 rupees and Bina gets 4 x 120 = 480 rupees.

Marking: 1 mark for finding one part as 120 rupees; 1 mark for both shares 360 and 480 rupees.

14. Speed = 240 / 4 = 60 km per hour. Time for 420 km = 420 / 60 = 7 hours.

Marking: 1 mark for the speed 60 km/h; 1 mark for dividing 420 by the speed; 1 mark for 7 hours.

15. An undistorted enlargement keeps width and height in the same ratio, so both are multiplied by the same scale factor. The scale factor is 25 / 10 = 2.5, so the new height is 15 x 2.5 = 37.5 cm.

Marking: 1 mark for recognising both dimensions scale equally; 1 mark for the scale factor 2.5; 1 mark for 37.5 cm.

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Topic references

NCERT Class 8 Mathematics, Ganita Prakash, Chapter 7: Proportional Reasoning-1.

https://ncert.nic.in/textbook/pdf/hegp107.pdf

Concept reference only. Questions and model answers are original Evater practice material, not an official NCERT paper.

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