JP Maths Revision

Attempt the paper before watching the solutions!

https://www.youtube.com/@JPMathsRevision

HIGHER TIER

Similar Shapes (Area and Volume)

INSTRUCTIONS

- Use **black ink** or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- You must **show all your working.**
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

INFORMATION

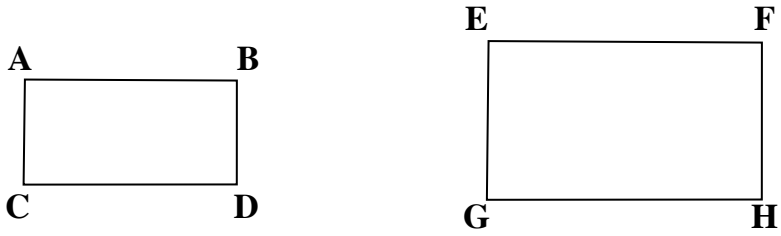
- The marks for **each** question are shown in brackets– *use this as a guide as to how much time to spend on each question.*

ADVICE

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

You've got this!

1. Rectangles ABCD and EFGH are mathematically similar.



AC = 6 cm

EG = 18 cm

The area of rectangle ABCD is 12 cm^2.

Find the area of rectangle EFGH

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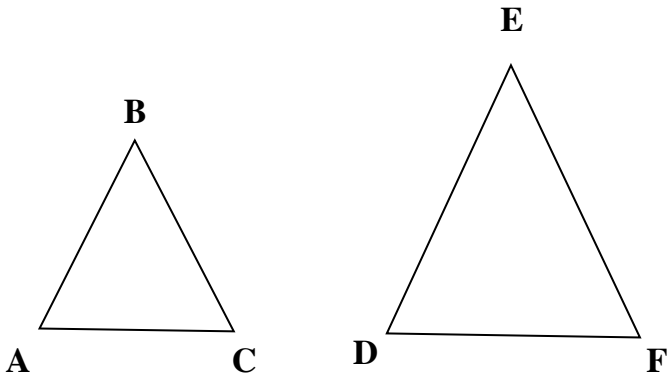
(Total for Question 1 is 2 marks)

2. Rectangles ABCD and EFGH are mathematically similar.



AC = 10 cm

DF = 15 cm

The area of rectangle DEF is 20 cm^2.

Find the area of triangle ABC

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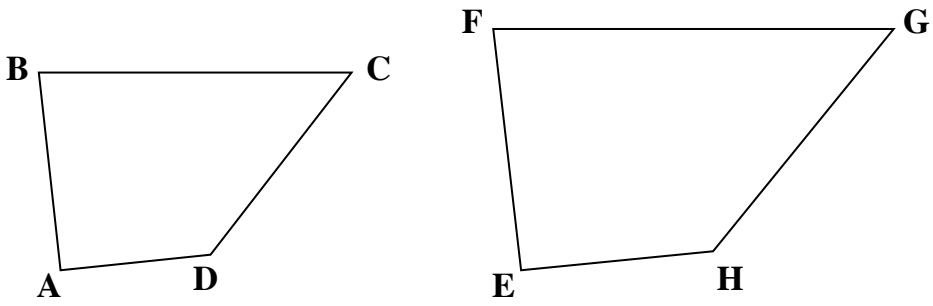
(Total for Question 2 is 2 marks)

3. Quadrilaterals ABCD and EFGH are mathematically similar.



The lengths of AB and EF are in the ratio 1:5.

The area of quadrilateral ABCD is 45 cm^2.

Find the area of triangle quadrilateral EFGH.

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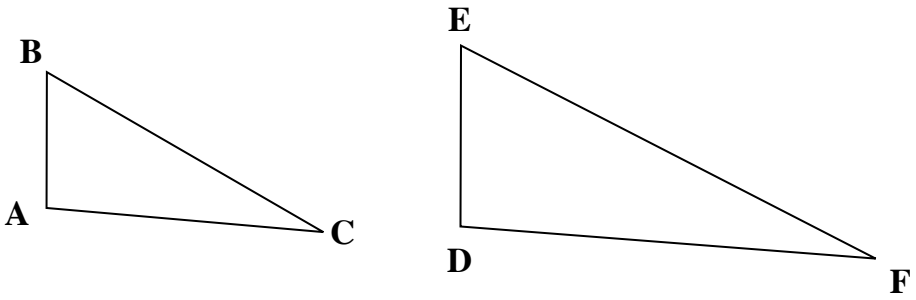
(Total for Question 3 is 3 marks)

4. Quadrilaterals ABCD and EFGH are mathematically similar.



The lengths of AC and DF are in the ratio 2:5.

The area of quadrilateral DEF is 300 cm^2.

Find the area of triangle quadrilateral ABC.

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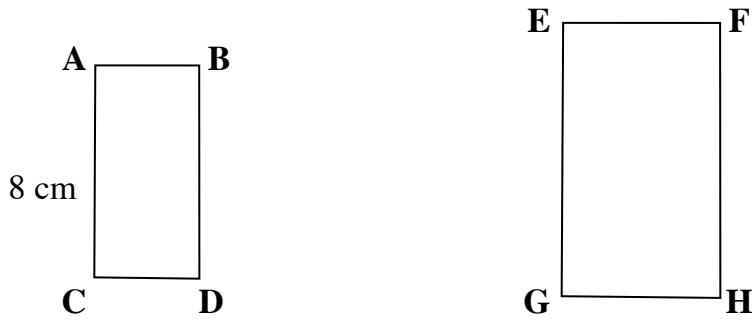
(Total for Question 4 is 3 marks)

5. Quadrilaterals ABCD and EFGH are mathematically similar.



The areas of ABCD and EFGH are 64cm^2 and 144cm^2 respectively.

AC = 8 cm.

Find the length of EG

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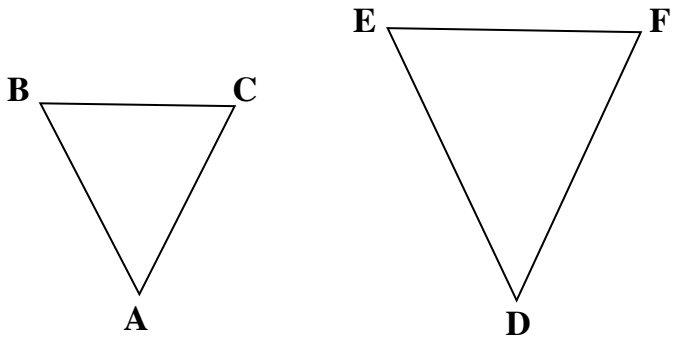
(Total for Question 5 is 3 marks)

6. Quadrilaterals ABCD and EFGH are mathematically similar.



The areas of ABCD and EFGH are 98 cm^2 and 200 cm^2 respectively.

BC = 7 cm.

Find the length of EF.

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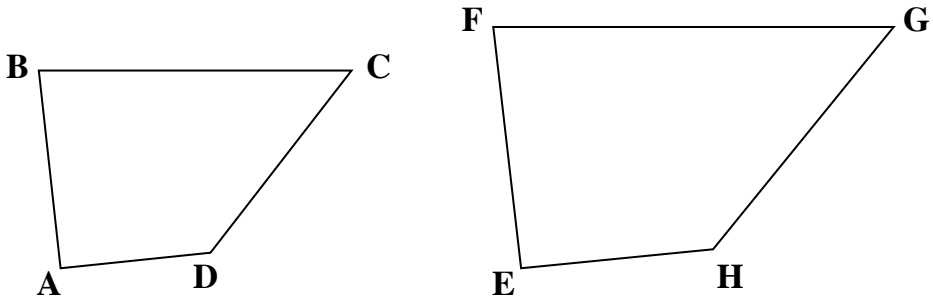
(Total for Question 6 is 3 marks)

7. Quadrilaterals ABCD and EFGH are mathematically similar.



The areas of ABCD and EFGH are in the ratio 25 : 49.

AB = 15 cm.

Find the length of EF.

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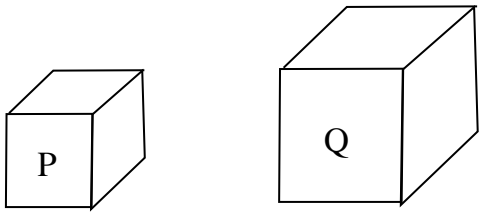
(Total for Question 7 is 3 marks)

8. P and Q are two similar cubes



The length of cube P is 4 cm. The length of cube Q is 8cm.

Cube P has a volume of 40 cm^3.

Find the volume of cube Q.

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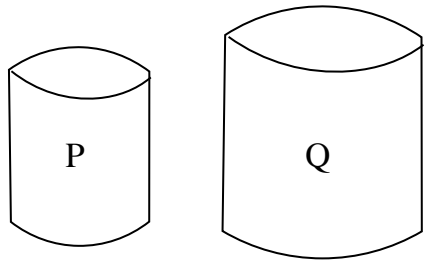
(Total for Question 8 is 3 marks)

9. P and Q are two similar cylinders.



The radius of cylinder P is 2 cm. The radius of cylinder Q is 8cm.

Cylinder P has a volume of 25 cm^3.

Find the volume of cube Q.

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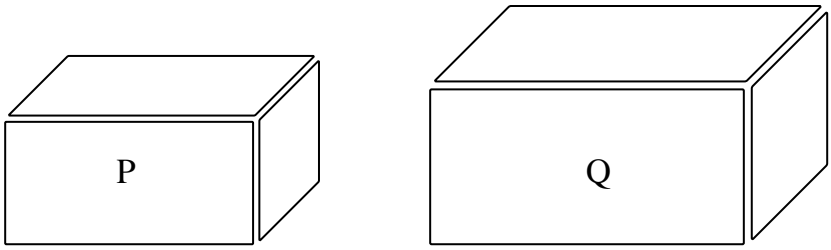
(Total for Question 9 is 3 marks)

10. P and Q are two similar cuboids.



The heights of the two cuboids are in the ratio 1:4.

Cuboid P has a volume of 72 cm^3.

Find the volume of cube Q.

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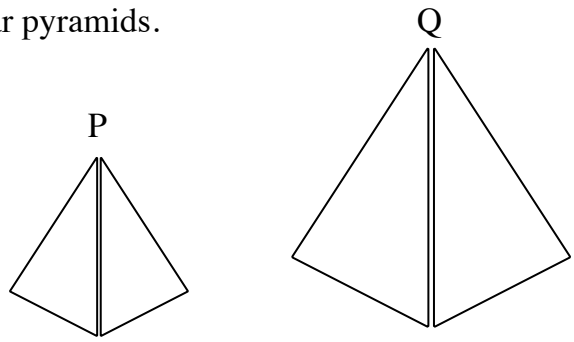
(Total for Question 10 is 3 marks)

11. P and Q are two similar pyramids.



The volumes of the two pyramids are 64 cm^3 and 512 cm^3.

The height of pyramid P is 6cm.

Work out the height of pyramid Q.

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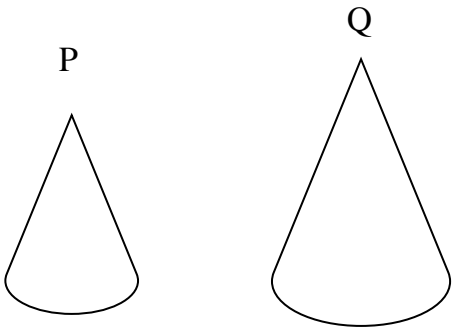
(Total for Question 11 is 3 marks)

12. P and Q are two similar cones.



The volumes of the cones are 250 cm^3 and 2000 cm^3.

The radius of the smaller cone is 5 cm.

Work out the radius of the larger cone.

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(Total for Question 12 is 3 marks)

13. The areas of two similar solids are in the ratio 4:9.

Find the ratio of their volumes.

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(Total for Question 13 is 2 marks)

14. Two similar solids have volumes in the ratio 64:343.

Find the ratio of their surface areas.

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(Total for Question 14 is 2 marks)

15. Two similar cones have volumes in the ratio 125:216.

The surface area of the smaller cone is 150 cm^2.

Find the surface area of the larger cone.

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(Total for Question 15 is 3 marks)