GCSE Maths Transformations and Similarity (Higher): check-up and exam-style questions: worksheet

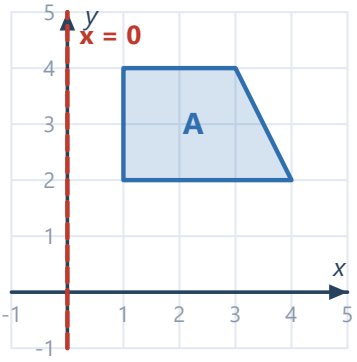
GCSE Maths - Transformations and Similarity - Higher - Test yourself

Name: _____ Date: _____ Score: _____

26 questions. Write your answers in the spaces. Answers and step-by-step help are free at **websink.site/gcse/maths/ch21-transformations-congruence-similarity/higher/check-up-and-exam-style-questions/**

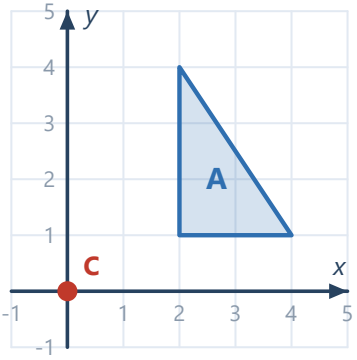
Exercise 21Z Check-up (non-calculator) Non-calculator

1 Reflect shape A in the *y*-axis. Write down the coordinates of the vertices of the image. A has vertices at (1, 2), (4, 2), (3, 4), (1, 4).



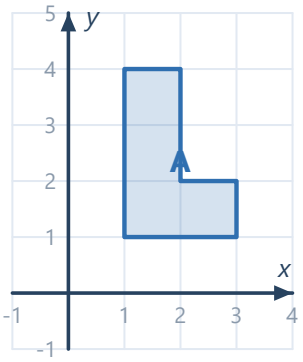
Answer:

2 Rotate shape A through 90° anticlockwise about the point C (0, 0). Write down the coordinates of the vertices of the image B. A has vertices at (2, 1), (4, 1), (2, 4).



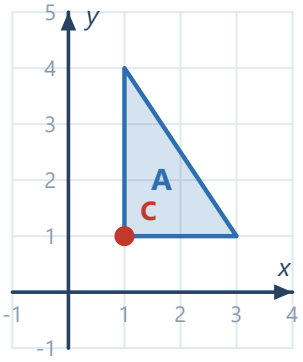
Answer:

3 Translate shape A by the vector $\begin{pmatrix} -3 \\ 4 \end{pmatrix}$. Write down the coordinates of the vertices of the image B. A has vertices at (1, 1), (3, 1), (3, 2), (2, 2), (2, 4), (1, 4).



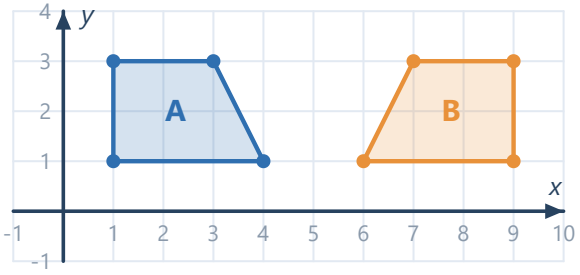
Answer:

4 Enlarge shape A with scale factor 2 and centre C (1, 1). Write down the coordinates of the vertices of the image B. A has vertices at (1, 1), (3, 1), (1, 4).



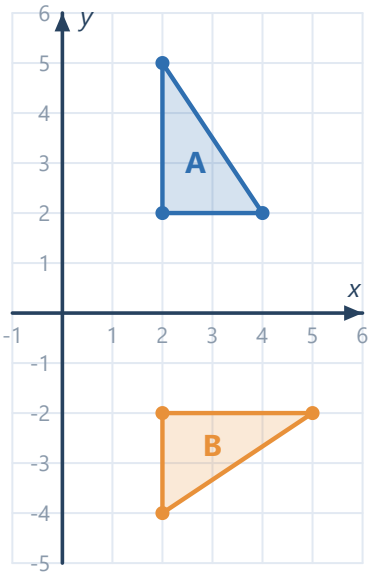
Answer:

5 Describe fully the single transformation that maps shape A onto shape B.



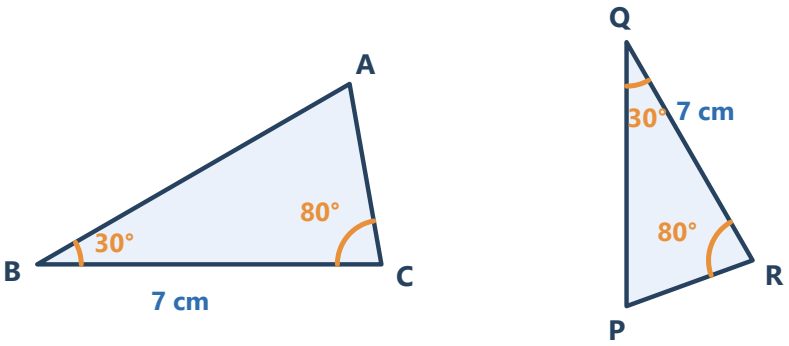
Answer:

6 Describe fully the single transformation that maps shape A onto shape B.



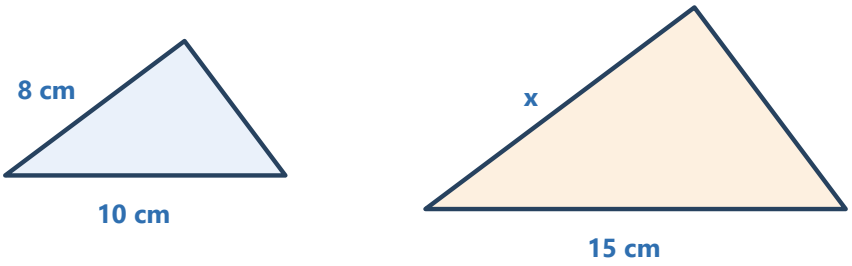
Answer:

7 Are triangles ABC and PQR congruent? Give a reason.



Answer:

8 The two shapes are mathematically similar. The diagrams are drawn to scale. Work out the value of *x*.



Answer:

9 Two similar shapes have a length scale factor of 5. The area of the smaller shape is 4 cm^2. Work out the area of the larger shape.

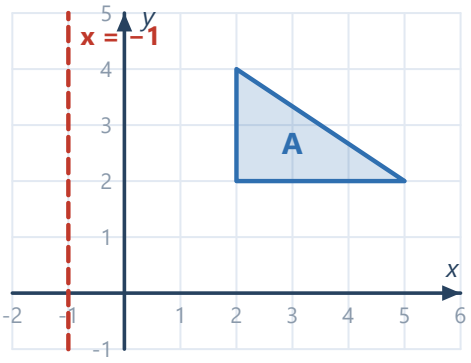
Answer:

10 The lengths of two similar shapes are in the ratio 3 : 5. Write down the ratio of their areas and the ratio of their volumes.

Answer:

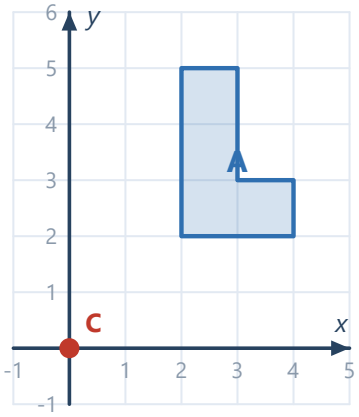
Exercise 21X Exam-style questions Non-calculator

1 Triangle A is drawn on the grid. Reflect triangle A in the line $x = -1$. Write down the coordinates of the vertices of the image. A has vertices at (2, 2), (5, 2), (2, 4). [2 marks]



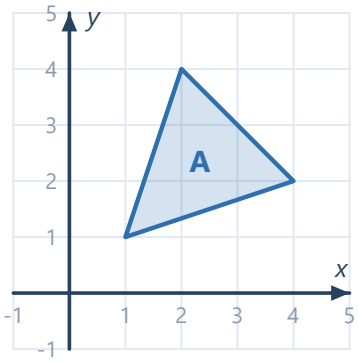
Answer:

2 Rotate shape A through 90° anticlockwise about the origin. Write down the coordinates of the vertices of the image. A has vertices at (2, 2), (4, 2), (4, 3), (3, 3), (3, 5), (2, 5). [2 marks]



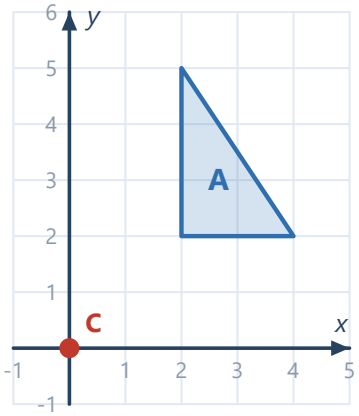
Answer:

3 Translate triangle A by the vector $\begin{pmatrix} -4 \\ 3 \end{pmatrix}$. Write down the coordinates of the vertices of the image. A has vertices at (1, 1), (4, 2), (2, 4). [2 marks]



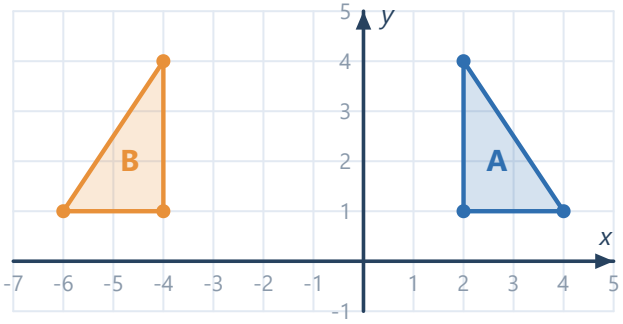
Answer:

4 Enlarge triangle A with scale factor 2 and centre (0, 0). Write down the coordinates of the vertices of the image. A has vertices at (2, 2), (4, 2), (2, 5). [2 marks]



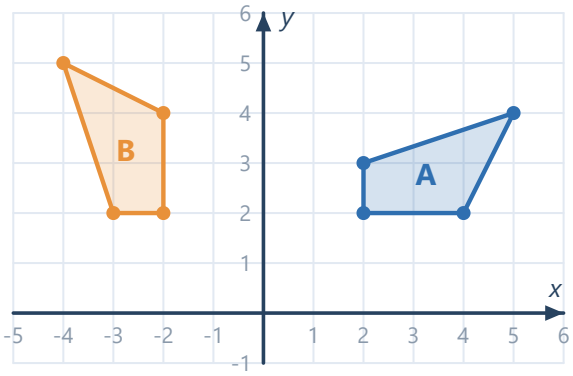
Answer:

5 Describe fully the single transformation that maps triangle A onto triangle B. [2 marks]



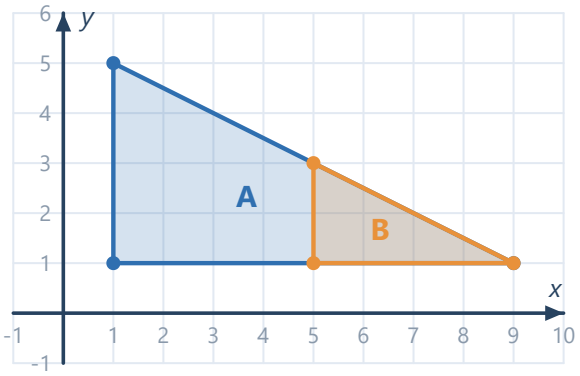
Answer:

6 Describe fully the single transformation that maps shape A onto shape B. [3 marks]



Answer:

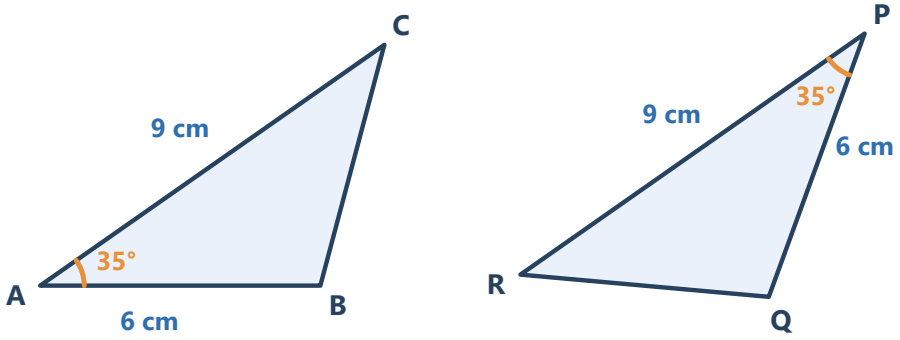
7 Describe fully the single transformation that maps triangle A onto triangle B. [3 marks]



Answer:

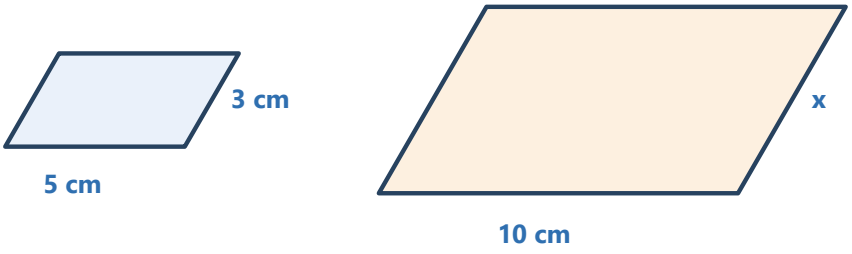
8 Triangles ABC and PQR are shown. Are the two triangles congruent? Give a reason for your answer.

[3 marks]



Answer:

9 The two parallelograms are mathematically similar. Work out the value of *x*. [3 marks]



Answer:

10 A flagpole casts a shadow 12 m long. At the same time a 1 m ruler, standing upright, casts a shadow 0.8 m long. Work out the height of the flagpole. [3 marks]

Answer:

11 Shape P and shape Q are similar. The length of Q is 3 times the length of P. The area of P is 8 cm^2. Work out the area of Q. [2 marks]

Answer:

12 Solid S and solid T are similar. Each length on T is 2 times the matching length on S. The volume of S is 12 cm^3. (a) Work out the volume of T. The surface area of S is 20 cm^2. (b) Work out the surface area of T. [4 marks]

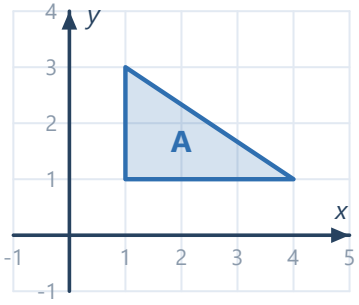
(a) (a) Volume of T

Answer:

(b) (b) Surface area of T

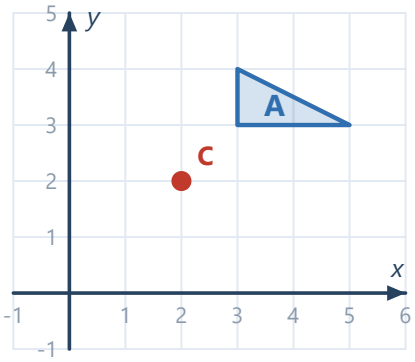
Answer:

13 Triangle A has vertices at (1, 1), (4, 1) and (1, 3). A is rotated 90° clockwise about the origin to give B. B is then reflected in the *y*-axis to give C. Describe fully the single transformation that maps A onto C. [4 marks]



Answer:

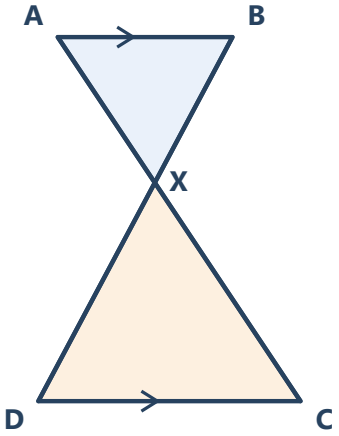
14 Triangle A has vertices at (3, 3), (5, 3) and (3, 4). Enlarge A with scale factor −2 and centre (2, 2). Write down the coordinates of the vertices of the image. [3 marks]



Answer:

15 **In the diagram, AC and BD cross at X. AB is parallel to CD. Prove that triangles XAB and XCD are similar.**

[3 marks]



Answer:

16 **Bottles A and B are similar. Bottle A is 8 cm tall and bottle B is 12 cm tall. The label on bottle A has an area of 60 cm². Bottle B holds 2700 ml. (a) Work out the area of the label on bottle B. (b) Work out how much bottle A holds.**

[5 marks]

(a) (a) Area of the label on B

Answer:

(b) (b) Capacity of bottle A

Answer:

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