Enlargements and scale factors: 10 practice questions

Year 9 · Free practice sheet from Tuterly · tuterly.com.au

Name: _____ Date: _____

Attempt all questions and show your working. Suggested time: 15 to 20 minutes.

Section A: Consolidating (Questions 1-4)

Question 1

A rectangle measures 4 cm by 6 cm. It is enlarged by a scale factor of 3.

What are the dimensions of the image?

Question 2

A triangle has sides of 10 cm, 15 cm and 20 cm. It is reduced using a scale factor of ⅕.

Find the side lengths of the image.

Question 3

A side of a shape is 8 cm long. After an enlargement, the matching side of the image is 20 cm long.

What is the scale factor?

Question 4

A shape is enlarged by a scale factor of 3. Write true or false for each statement.

(a) The angles in the image are the same size as the angles in the original shape.

(b) The side lengths in the image are the same as in the original shape.

(c) The image is the same shape as the original.

(d) The perimeter of the image is 3 times the perimeter of the original.

Section B: Standard (Questions 5-10)

Question 5

Triangle ABC has vertices A(1, 2), B(3, 2) and C(1, 5).

It is enlarged by a scale factor of 2 with the centre of enlargement at the origin (0, 0). Write the coordinates of A', B' and C'.

Question 6

Square PQRS has vertices P(4, 6), Q(8, 6), R(8, 10) and S(4, 10).

(a) It is enlarged by a scale factor of ½ with the centre of enlargement at the origin. Write the coordinates of the image P'Q'R'S'.

(b) Find the side length of the original square and of the image.

Question 7

Triangle DEF has vertices D(2, 1), E(4, 1) and F(4, 3).

It is enlarged by a scale factor of 3 with the centre of enlargement at (1, 1).

Find the coordinates of D', E' and F'. (Hint: find how far each vertex is from the centre across and up, multiply those distances by 3, then measure them from the centre.)

Question 8

Triangle JKL has vertices J(3, 1), K(5, 1) and L(3, 4). Its image after an enlargement is triangle J'K'L' with vertices J'(5, 1), K'(9, 1) and L'(5, 7).

(a) Find the scale factor by comparing the lengths of JK and J'K'.

(b) The centre of enlargement lies on the line through L and L' and also on the line through J and J'. Find the coordinates of the centre of enlargement.

Question 9

A photo measures 10 cm by 15 cm. It is enlarged by a scale factor of 3 to make a poster.

(a) Find the dimensions of the poster.

(b) Find the area of the photo and the area of the poster.

(c) How many times larger is the area of the poster than the area of the photo? How is this number related to the scale factor?

Question 10

A triangle has a perimeter of 36 cm and an area of 72 cm^2. It is reduced using a scale factor of ⅓.

(a) Find the perimeter of the image.

(b) Find the area of the image.

Enlargements and scale factors: answers

Year 9 · Free practice sheet from Tuterly · tuterly.com.au

Question 1

Answer: 12 cm by 18 cm

Question 2

Answer: 2 cm, 3 cm and 4 cm

Question 3

Answer: 2.5 (also accept 5/2) (20 ÷ 8)

Question 4

Answer: (a) true (b) false (c) true (d) true

Question 5

Answer: A'(2, 4), B'(6, 4), C'(2, 10)

Question 6

Answer: (a) P'(2, 3), Q'(4, 3), R'(4, 5), S'(2, 5) (b) original 4 units, image 2 units

Question 7

Answer: D'(4, 1), E'(10, 1), F'(10, 7) (for example F is 3 across and 2 up from the centre, so F' is 9 across and 6 up)

Question 8

Answer: (a) 2 (JK = 2, J'K' = 4) (b) (1, 1) (the line through J and J' is y = 1; the line through L(3, 4) and L'(5, 7) meets y = 1 at x = 1)

Question 9

Answer: (a) 30 cm by 45 cm (b) photo 150 cm^2, poster 1350 cm^2 (c) 9 times; 9 = 3^2, the square of the scale factor

Question 10

Answer: (a) 12 cm (b) 8 cm^2 (72 × 1/9)