HIGHER

5.18H Similar Shapes (Lengths): Higher Tier Practice

Total Marks

EDEXCEL Edexcel 1MA1 · Calculator allowed · about 75 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Two similar triangles have corresponding sides in the ratio 5:8. A side of the smaller triangle is 15 cm. Work out the length of the corresponding side in the larger triangle.

(Total for Question 1 is 2 marks)

---

2 Triangle ABC is similar to triangle DEF. AB = 12 cm, BC = 18 cm, DE = 20 cm. Find EF. Give your answer correct to 1 decimal place.

(Total for Question 2 is 3 marks)

---

3 Triangle PQR is similar to triangle STU. In triangle PQR, PR = 14 cm and QR = 21 cm. In triangle STU, SU = 10 cm.

(a) Find the scale factor from triangle PQR to triangle STU (give as a decimal). (1 mark)

(b) Find TU, the side corresponding to QR. (3 marks)

(a) Find the scale factor from triangle PQR to triangle STU (give as a decimal). **(1)**

.....

(b) Find TU, the side in triangle STU corresponding to QR. **(3)**

.....

(Total for Question 3 is 4 marks)

4 Two similar rectangles have one pair of corresponding sides in the ratio (x + 2) : (3x). This pair of sides has length 8 cm in the smaller rectangle and length 12 cm in the larger rectangle (so 8 cm corresponds to x + 2 and 12 cm corresponds to 3x). The smaller rectangle's other side is 10 cm. Work out x and the larger rectangle's side corresponding to the 10 cm side.

(a) Find x. **(2)**

.....

(b) Find the length in the larger rectangle that corresponds to the smaller rectangle's 10 cm side. Give your answer in cm. **(2)**

.....

(Total for Question 4 is 4 marks)

---

5 A right-angled triangle ABC (right angle at B) is enlarged from triangle ABC to triangle A'B'C' with centre of enlargement at B and scale factor k. The length BA = 7 cm and BC = 24 cm. After enlargement BA' = 21 cm.
(a) Find k. (1 mark)
(b) Find B'C', the image of BC, and state whether triangle A'B'C' is still right-angled at B'. Explain briefly.

(a) Find k. **(1)**

.....

(b) Find B'C' and state whether triangle A'B'C' is still right-angled at B'. Explain briefly. **(3)**

.....

(Total for Question 5 is 4 marks)

Mark scheme · 5.18H Similar Shapes (Lengths): Higher Tier Practice

Question 1

- **M1** multiply 15 by scale factor 8/5 or show equivalent method
- **A1** 24 cm cao
- **Answer: 24 cm, because 15 x (8/5) = 24 (scale factor 8/5).**

Question 2

- **M1** identify scale factor = DE/AB = 20/12 = 5/3 and apply to BC or set up proportion EF/BC = DE/AB
- **M1** compute EF = 18 x (5/3) or equivalent
- **A1** 30.0 cm awrt to 1 dp
- **Answer: 30.0 cm**

Question 3

- (a) **B1** scale factor SU/PR = 10/14 = 5/7 = 0.714285... or exact fraction 5/7
- **(a) Answer: 5/7 or 0.714285... (SU corresponds to PR: 10/14 = 5/7)**
- (b) **M1** use TU = QR x (5/7) or set up correct proportion
- (b) **M1** calculate TU = 21 x 5/7
- (b) **A1** 15 cm cao
- **(b) Answer: 15 cm**

Question 4

- (a) **M1** form equation (x+2)/(3x) = 8/12 and simplify to (x+2)/(3x) = 2/3
- (a) **A1** x = 2 cao
- **(a) Answer: x = 2**
- (b) **M1** use scale factor = 3x/(x+2) with x = 2, so scale factor = 6/4 = 3/2 (consistent with 12/8 = 3/2) and apply to 10
- (b) **A1** 15 cm cao
- **(b) Answer: 15 cm**

Question 5

- (a) **B1** k = BA'/BA = 21/7 = 3
- **(a) Answer: k = 3**
- (b) **M1** use B'C' = k x BC = 3 x 24
- (b) **A1** 72 cm cao for B'C'
- (b) **B1** explain: enlargement from B preserves the angle at B so triangle A'B'C' is right-angled at B' oe
- **(b) Answer: B'C' = 72 cm; triangle A'B'C' is still right-angled at B' because an enlargement with centre at B preserves the angle at B (same rays), so the right angle is preserved.**