GCSE Maths: Pythagoras with coordinates, isosceles and equilateral triangles (Higher): answers

GCSE Maths - Pythagoras and Trigonometry - Higher - Lesson 20.3

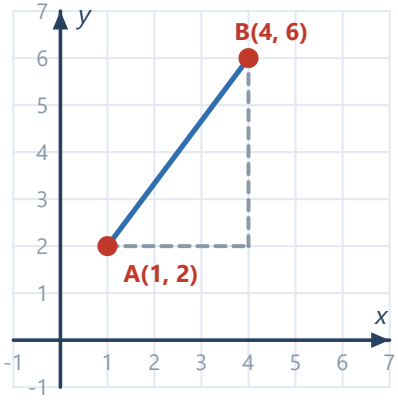
Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at **websink.site/gcse/maths/ch20-pythagoras-trigonometry/higher/pythagoras-with-coordinates-isosceles-and-equilateral/**

Exercise 20D Coordinates, isosceles and equilateral triangles

Calculator allowed

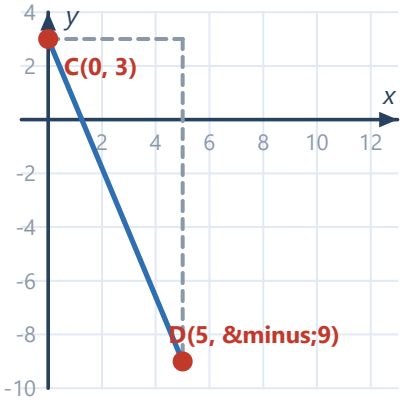
1 Work out the distance between each pair of points. Give your answers correct to 1 decimal place when they are not whole numbers.

(a) A(1, 2) and B(4, 6)



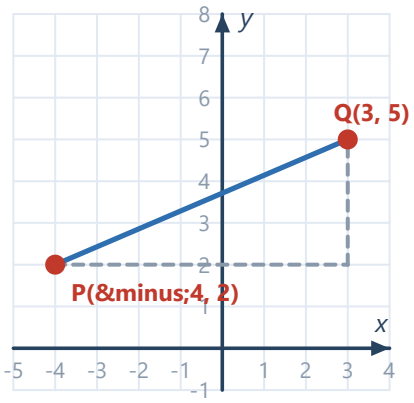
Answer: 5

(b) C(0, 3) and D(5, −9)



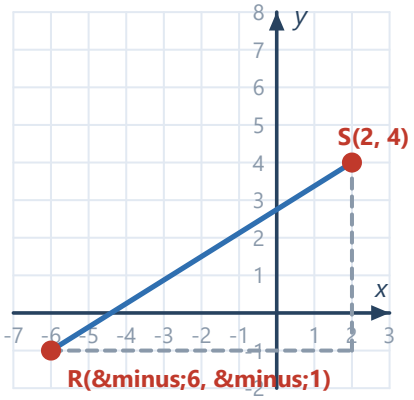
Answer: 13

(c) P(−4, 2) and Q(3, 5)



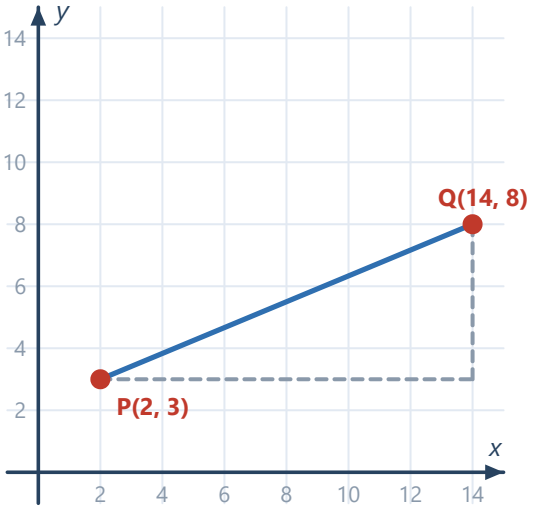
Answer: 7.6

(d) R(−6, −1) and S(2, 4)



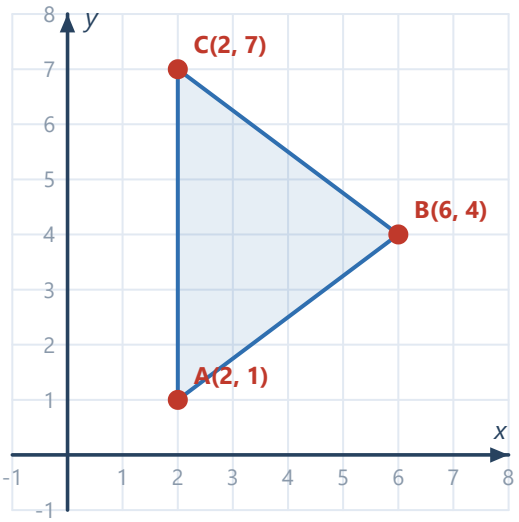
Answer: 9.4

2 On a map, each grid square is 1 km wide. A town P is at (2, 3) and a town Q is at (14, 8). Work out the straight-line distance from P to Q.



Answer: 13 km

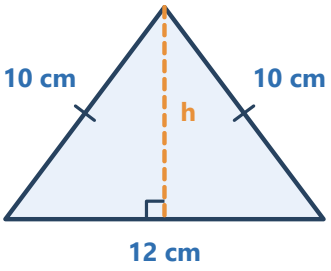
3 A(2, 1), B(6, 4) and C(2, 7) are the vertices of a triangle. Show that triangle ABC is isosceles.



Answer: AB = BC = 5, so it is isosceles

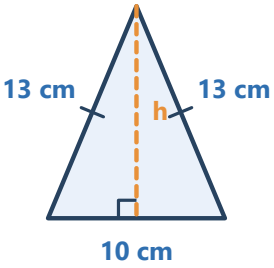
4 Each isosceles triangle has the equal sides and the base shown. Work out the perpendicular height *h* of each triangle.

(a) Equal sides 10 cm, base 12 cm



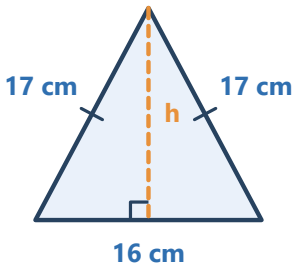
Answer: 8 cm

(b) Equal sides 13 cm, base 10 cm



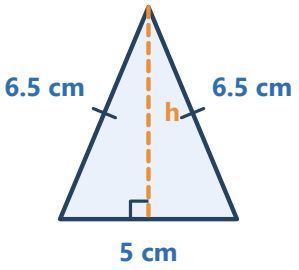
Answer: 12 cm

(c) Equal sides 17 cm, base 16 cm



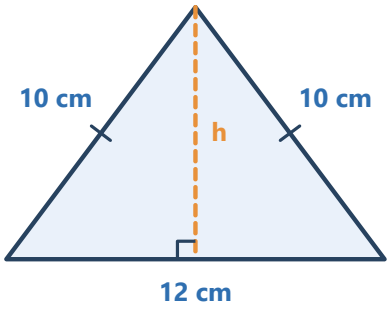
Answer: 15 cm

(d) Equal sides 6.5 cm, base 5 cm



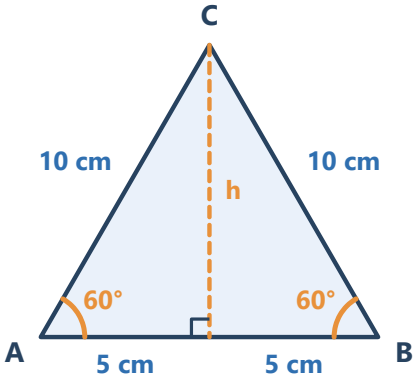
Answer: 6 cm

5 An isosceles triangle has two sides of length 10 cm and a base of 12 cm. Work out its area.



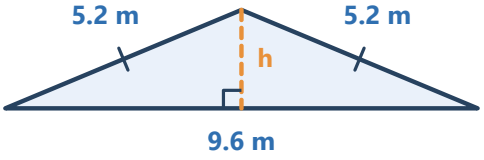
Answer: 48 cm^2

6 An equilateral triangle has sides of length 10 cm. Work out its height. Give your answer correct to 2 decimal places.



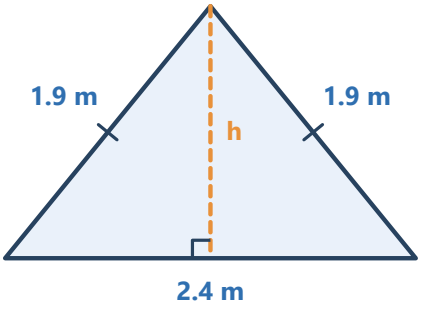
Answer: 8.66 cm

7 A roof is supported by an isosceles triangular frame. The two sloping beams are each 5.2 m long and the horizontal span is 9.6 m. Work out the height of the roof frame.



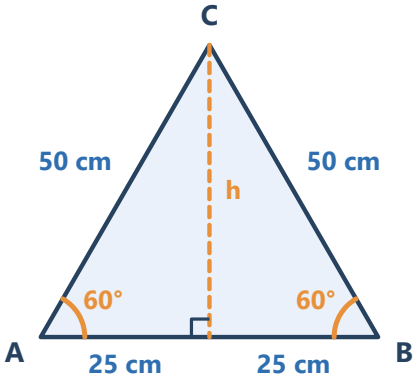
Answer: 2 m

8 The cross-section of a tent is an isosceles triangle. The sloping sides are 1.9 m long and the base is 2.4 m wide. Work out the height of the tent. Give your answer correct to 2 decimal places.



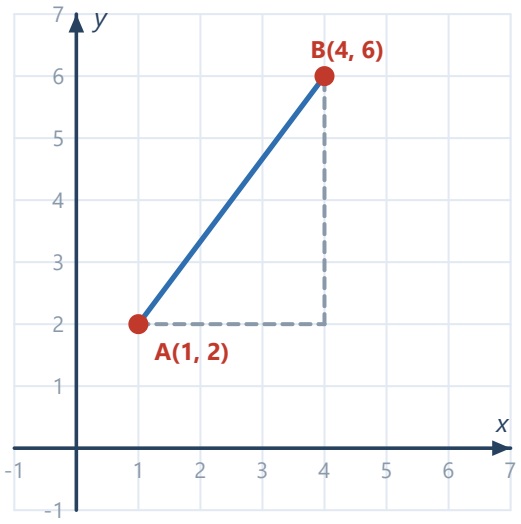
Answer: 1.47 m

9 A road sign is an equilateral triangle of side 50 cm. Work out the area of the sign. Give your answer correct to 1 decimal place.



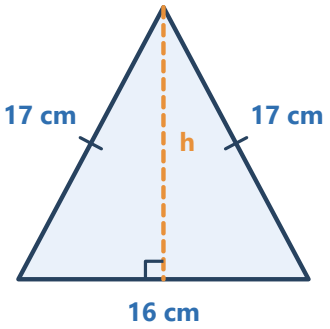
Answer: 1082.5 cm^2

10 Zara says: "The distance between A(1, 2) and B(4, 6) is 3 + 4 = 7." Explain why Zara is wrong and work out the correct distance.



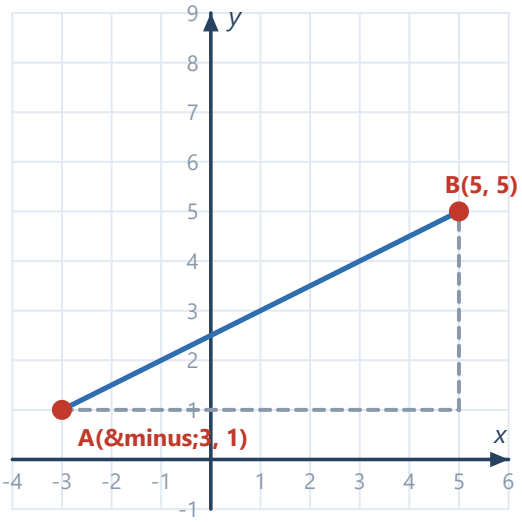
Answer: Zara added the steps. The distance is 5.

11 Isosceles triangle ABC has AB = AC = 17 cm and BC = 16 cm. **Show that** its area is 120 cm^2.



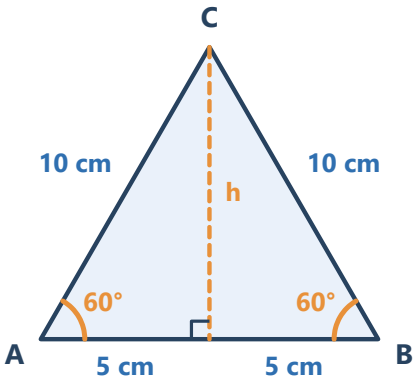
Answer: Height 15 cm, area = ½ × 16 × 15 = 120 cm^2

12 A is the point (−3, 1) and B is the point (5, 5). Work out the length of AB. Give your answer as a simplified surd.



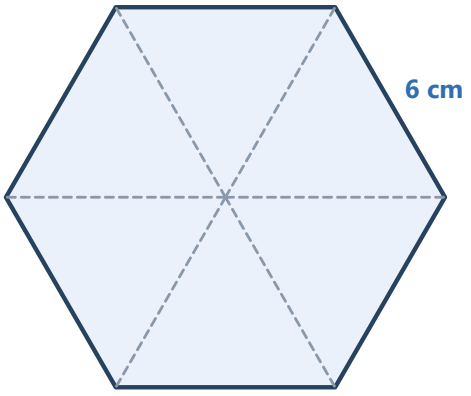
Answer: $4\sqrt{5}$

13 An equilateral triangle has sides of length 10 cm. Work out its height and its area. Give both answers as exact surds.



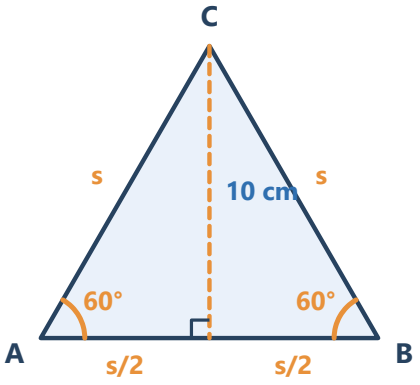
Answer: Height $5\sqrt{3}$ cm, area $25\sqrt{3}$ cm^2

14 A regular hexagon has sides of length 6 cm. It is made from six equilateral triangles. Work out the exact area of the hexagon, then give the answer correct to 1 decimal place.



Answer: $54\sqrt{3}$ cm^2 = 93.5 cm^2

15 **Challenge.** An equilateral triangle has height 10 cm. Work out the length of its side. Give your answer correct to 1 decimal place.



Answer: 11.5 cm

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