

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

GCSE Maths - Pythagoras and Trigonometry - Higher - Lesson 20.3

Name: _____

Date: _____

Score: _____

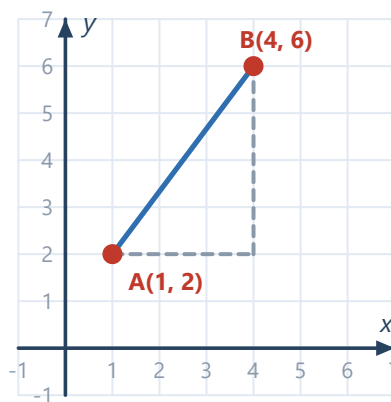
15 questions. Write your answers in the spaces. Answers and step-by-step help are free at websink.site/gcse/maths/ch20-pythagoras-trigonometry/higher/pythagoras-with-coordinates-isosceles-and-equilateral/

Exercise 20D Coordinates, isosceles and equilateral triangles

Calculator allowed

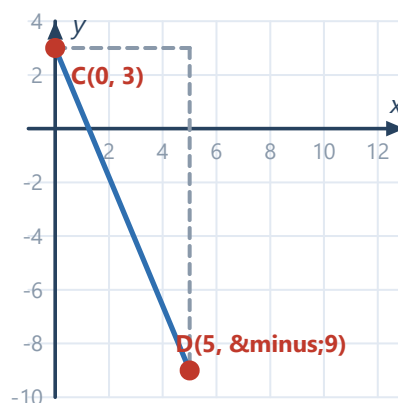
- 1 Work out the distance between each pair of points. Give your answers correct to 1 decimal place when they are not whole numbers.

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



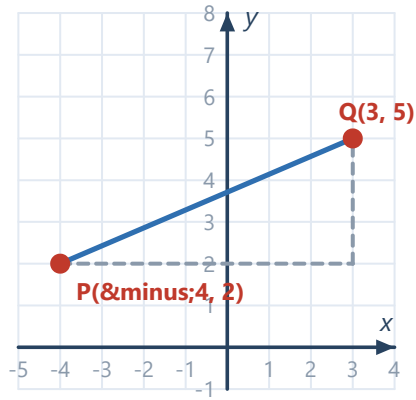
Answer:

(b) C(0, 3) and D(5, -9)



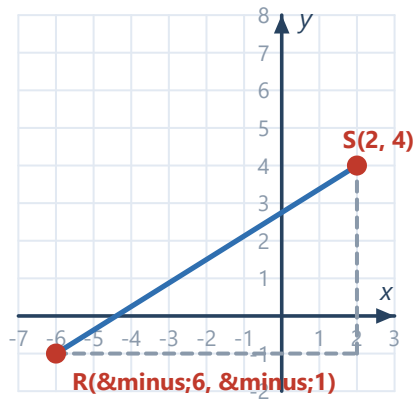
Answer:

(c) $P(-4, 2)$ and $Q(3, 5)$



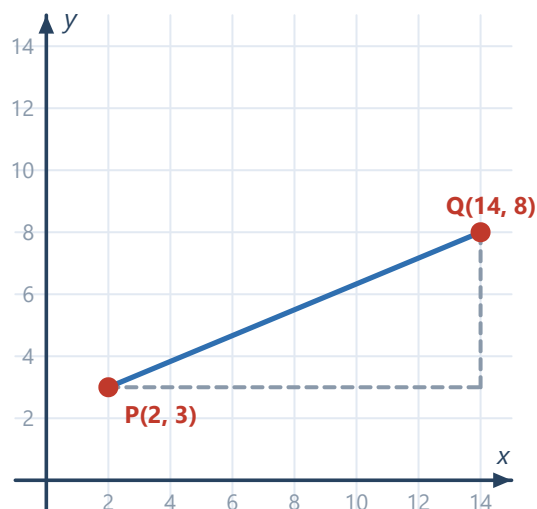
Answer:

(d) $R(-6, -1)$ and $S(2, 4)$



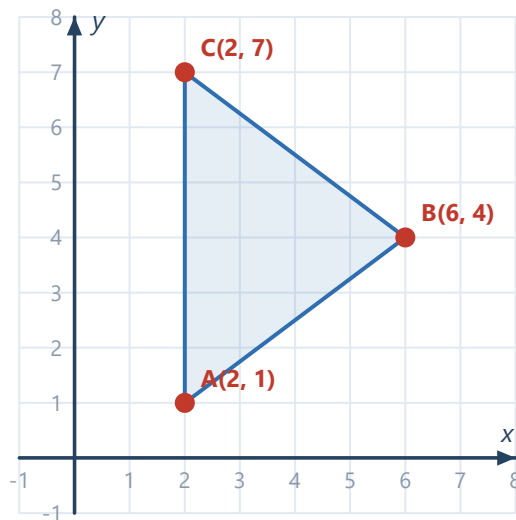
Answer:

- 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:

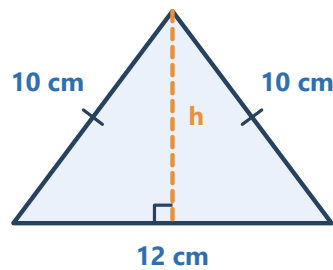
- 3 A(2, 1), B(6, 4) and C(2, 7) are the vertices of a triangle. Show that triangle ABC is isosceles.



Answer:

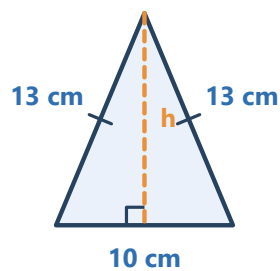
- 4 Each isosceles triangle has the equal sides and the base shown. Work out the perpendicular height h of each triangle.

- (a) Equal sides 10 cm, base 12 cm



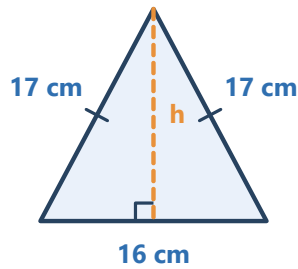
Answer:

- (b) Equal sides 13 cm, base 10 cm



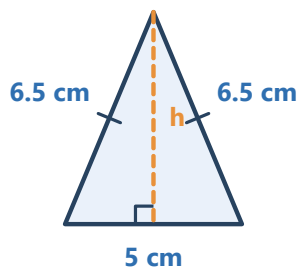
Answer:

- (c) Equal sides 17 cm, base 16 cm



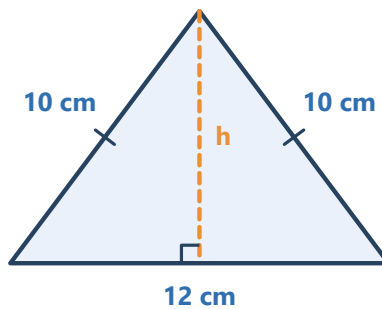
Answer:

- (d) Equal sides 6.5 cm, base 5 cm



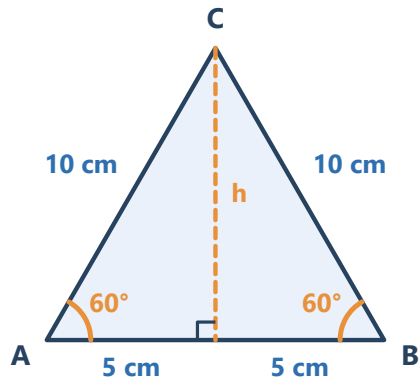
Answer:

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



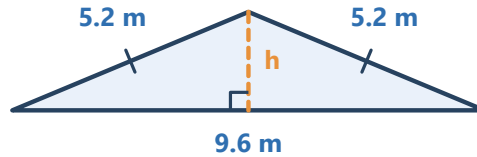
Answer:

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



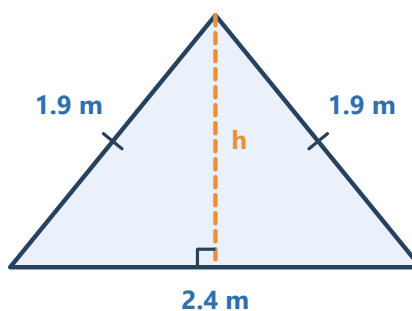
Answer:

- 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.



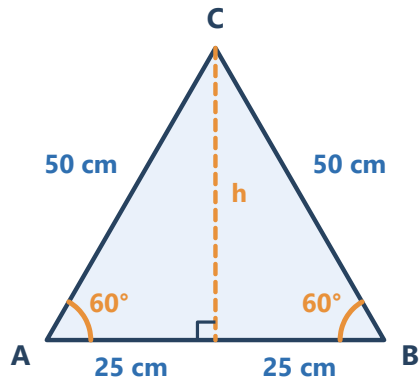
Answer:

- 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.



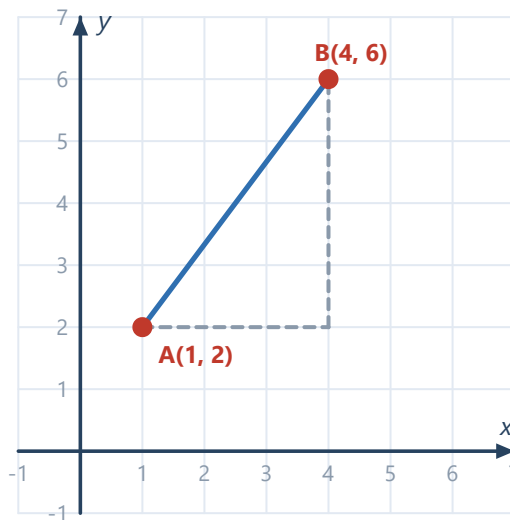
Answer:

- 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.



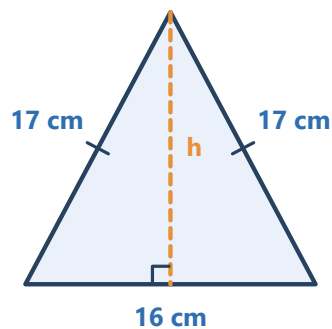
Answer:

- 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.



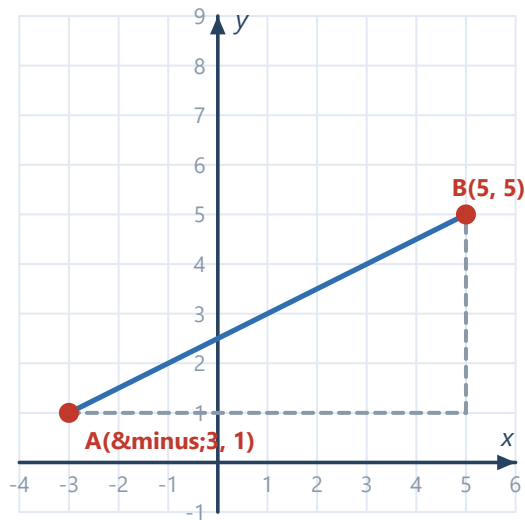
Answer:

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



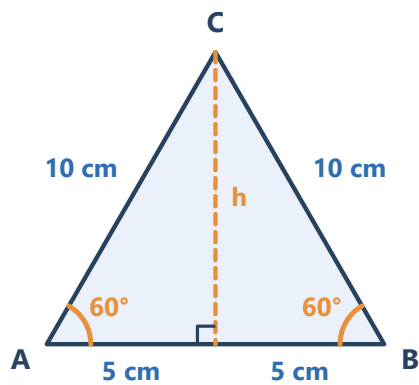
Answer:

- 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.



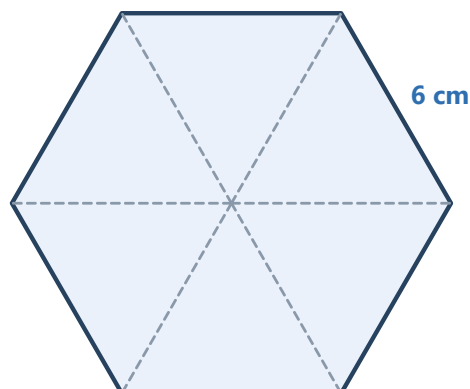
Answer:

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



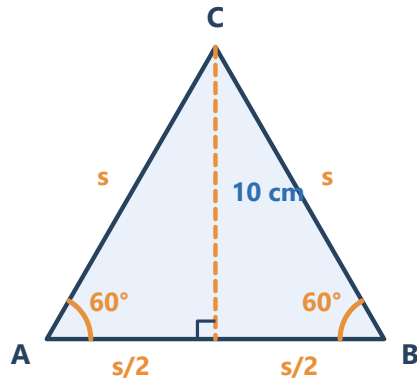
Answer:

- 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:

- 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: