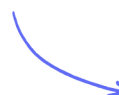


Pythagoras & Trigonometry

Pythagoras Theorem / Trigonometry to Find Lengths / Trigonometry to Find Angles / Angles of Elevation & Depression / Exact Trig Values

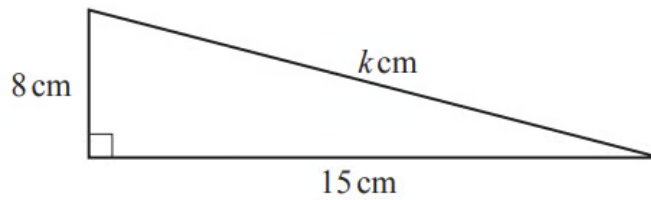
Easy (11 questions)	/21
Medium (13 questions)	/35
Hard (9 questions)	/43
Total Marks	/99

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Easy Questions

1



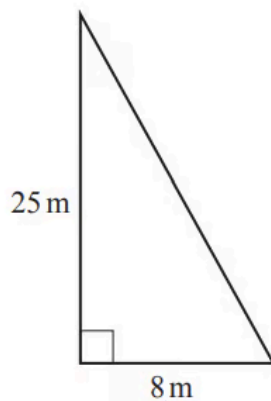
NOT TO
SCALE

Calculate the value of k .

$k =$

(2 marks)

2



NOT TO
SCALE

The diagram shows a flagpole in a garden.

The flagpole has height 25 m.

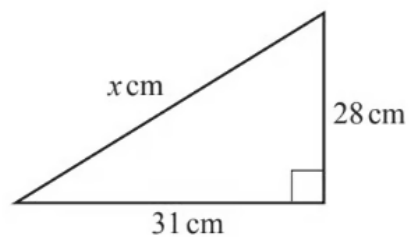
A rope from the top of the flagpole is tied to the ground 8 m from its base.

Calculate the length of this rope.

..... m

(2 marks)

3 The diagram shows a right-angled triangle.

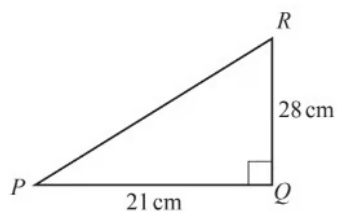


NOT TO
SCALE

Show that the value of x is 41.8, correct to 3 significant figures.

(2 marks)

4



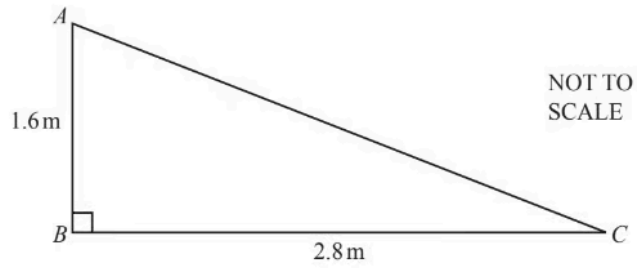
NOT TO
SCALE

Calculate PR .

$PR = \dots\dots\dots$ cm

(2 marks)

5

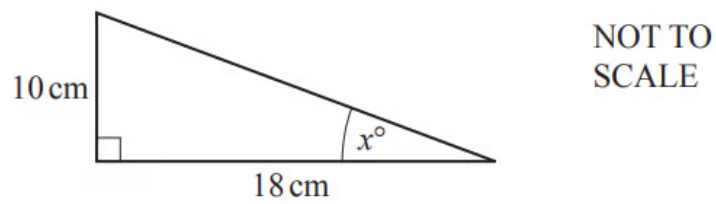


Calculate AC .

$AC = \dots\dots\dots\text{ m}$

(2 marks)

6

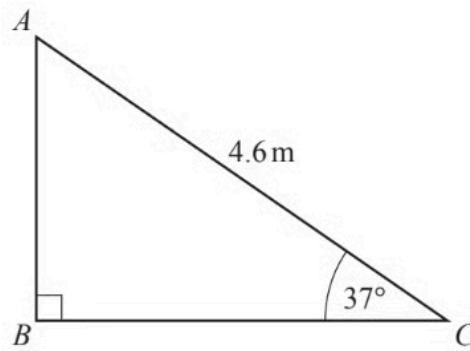


Calculate the value of x .

$x = \dots\dots\dots$

(2 marks)

7



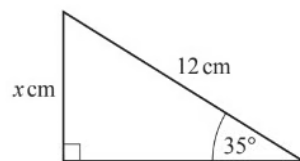
NOT TO
SCALE

The diagram shows a right-angled triangle ABC .
Calculate AB .

$AB = \dots\dots\dots$ m

(2 marks)

8



NOT TO
SCALE

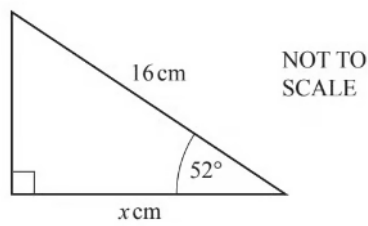
The diagram shows a right-angled triangle.

Calculate the value of x .

$x = \dots\dots\dots$

(2 marks)

9 The diagram shows a right-angled triangle.



Use trigonometry to calculate the value of x .

$x = \dots\dots\dots$

(2 marks)

10



The diagram shows a right-angled triangle.

Calculate the value of x .

$x = \dots\dots\dots$

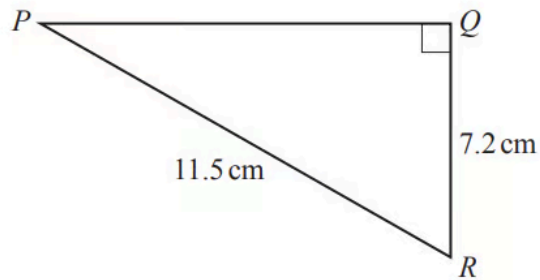
(2 marks)

11 Write down the value of $\sin 45^\circ$.

(1 mark)

Medium Questions

1



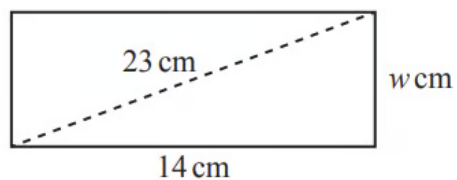
NOT TO
SCALE

Calculate PQ .

$PQ = \dots\dots\dots\text{ cm}$

(3 marks)

2



NOT TO
SCALE

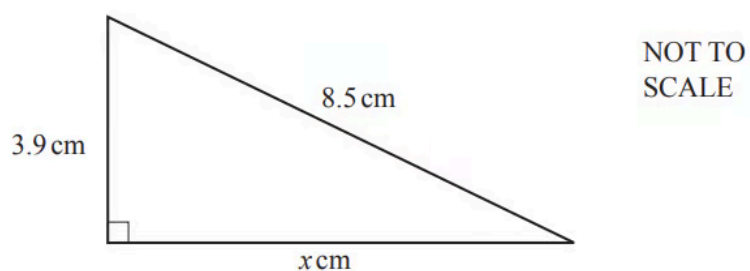
The diagram shows a rectangle 14 cm by $w\text{ cm}$.
The diagonal is 23 cm .

Calculate the value of w .

$w = \dots\dots\dots$

(3 marks)

3



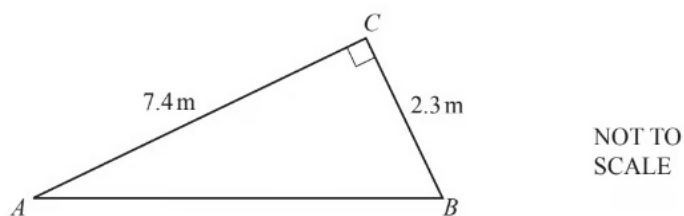
The diagram shows a right-angled triangle.

Calculate the value of x .

$x = \dots\dots\dots$

(3 marks)

4



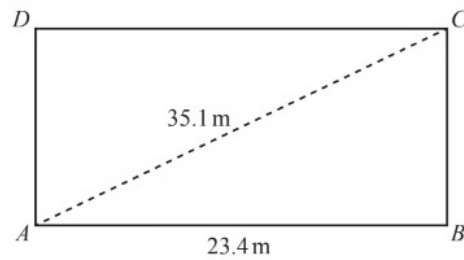
The diagram shows a right-angled triangle ABC .

Calculate the length of AB .

$AB = \dots\dots\dots$ m

(2 marks)

5



NOT TO
SCALE

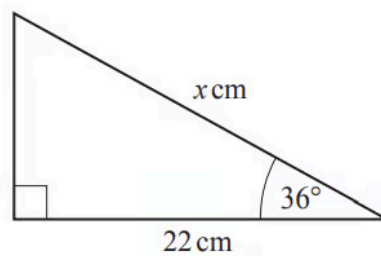
The diagram shows a rectangular playground $ABCD$. $AB = 23.4\text{ m}$ and $AC = 35.1\text{ m}$.

Calculate BC .

$BC = \dots\dots\dots\text{ m}$ [3]

(3 marks)

6

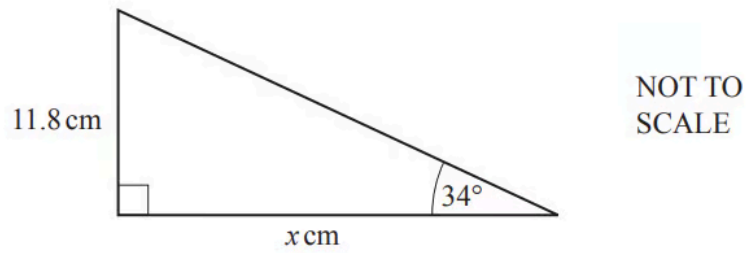


NOT TO
SCALE

Show that the value of x is 27.2, correct to 3 significant figures.

(3 marks)

7

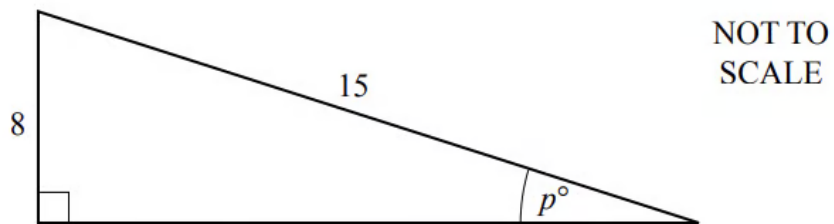


Calculate the value of x .

$x = \dots\dots\dots$

(3 marks)

8

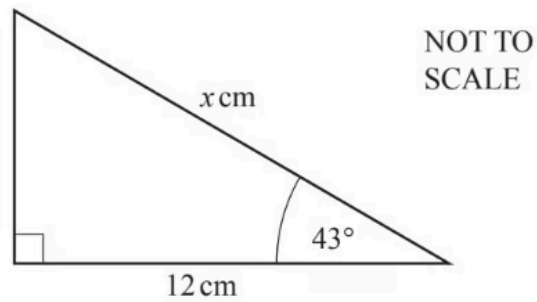


Use trigonometry to calculate the value of p .

$p = \dots\dots\dots$

(2 marks)

9

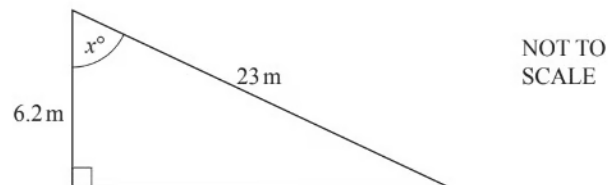


Use trigonometry to calculate the value of x .

$x = \dots\dots\dots$

(3 marks)

10



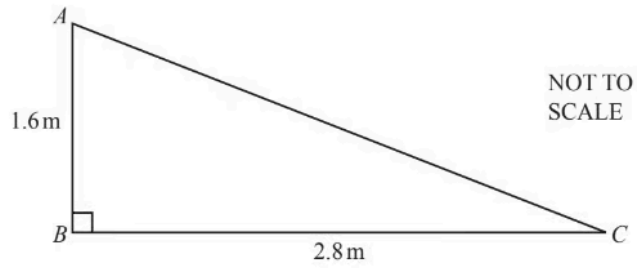
The diagram shows a right-angled triangle.

Calculate the value of x .

$x = \dots\dots\dots$

(2 marks)

11



Calculate the size of angle BAC .

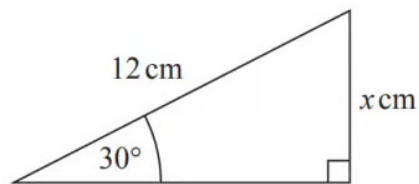
Angle BAC =

(2 marks)

12 (a) Write down the exact value of $\cos 30^\circ$

(1 mark)

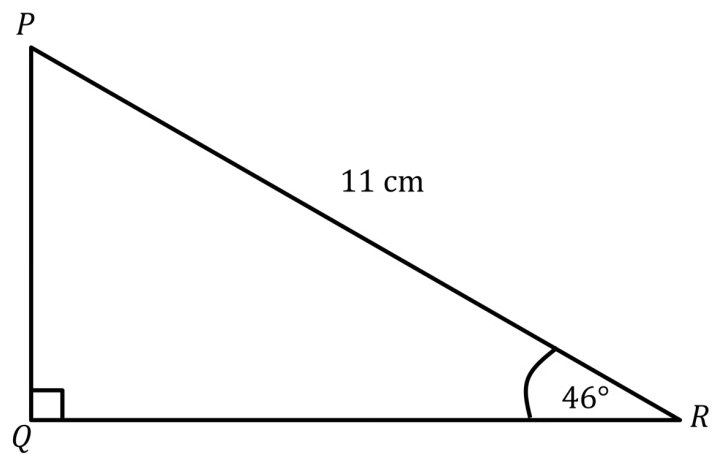
(b)



Given that $\sin 30^\circ = 0.5$,
work out the value of x .

(2 marks)

13 PQR is a right-angled triangle.



Calculate the length of PQ .

Give your answer correct to 2 decimal places.

(3 marks)

Hard Questions

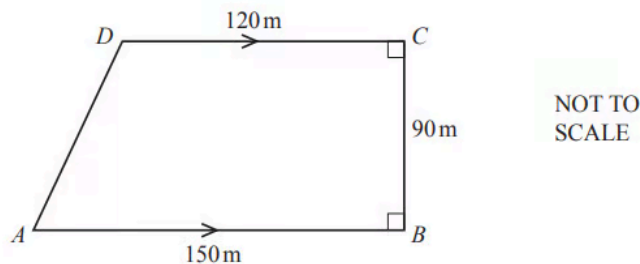
- 1 The length of one side of a rectangle is 12cm.
The length of the diagonal of the rectangle is 13cm.

Calculate the area of the rectangle.

..... cm^2

(3 marks)

2



The diagram shows a field in the shape of a trapezium. $AB = 150 \text{ m}$, $BC = 90 \text{ m}$ and $CD = 120 \text{ m}$.

Angle $ABC = \text{angle } BCD = 90^\circ$.

- i) Show that $AD = 95\text{m}$, correct to the nearest metre.

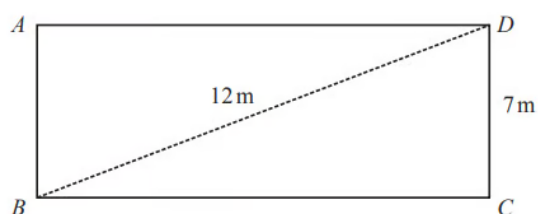
[3]

- ii) A fence is built around the perimeter of the field.
It costs \$48 to build each 5-metre section of the fence.
Calculate the cost of building this fence.

\$ [3]

(6 marks)

3 Sam has a rectangular pond, $ABCD$.



NOT TO
SCALE

i) Calculate BC .

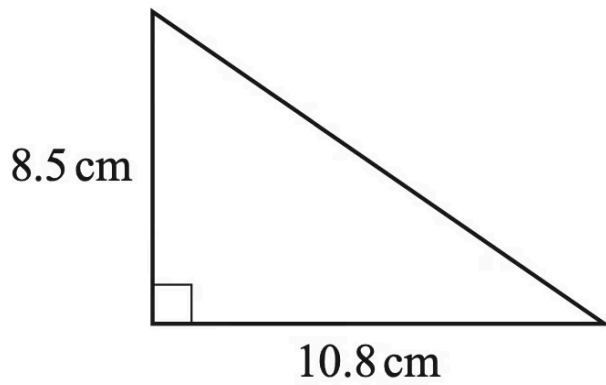
$BC = \dots\dots\dots\text{m}$ [3]

ii) He puts a fence around the edge of the pond. Calculate the length of the fence.

$\dots\dots\dots\text{m}$ [1]

(4 marks)

4



NOT TO
SCALE

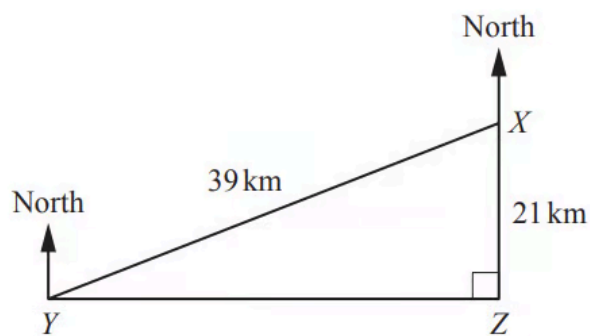
The diagram shows a right-angled triangle.

Calculate the perimeter.

..... cm [3]

(3 marks)

5



NOT TO
SCALE

A speedboat starts at X and travels to Y , then to Z and then back to X .

Z is due south of X and Y is due west of Z .

$XY = 39\text{ km}$ and $XZ = 21\text{ km}$.

i) Calculate YZ .

$YZ = \dots\dots\dots\text{km}$ [3]

ii) Calculate angle YXZ .

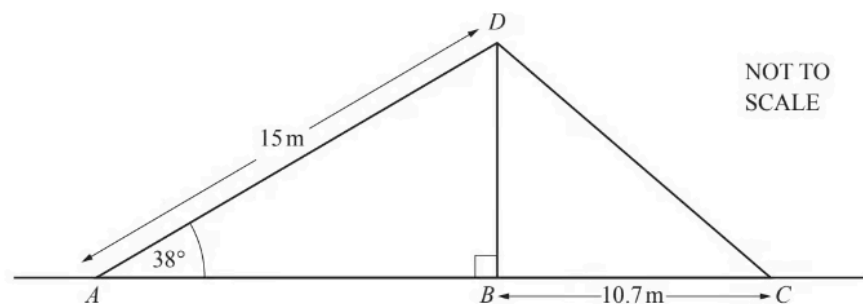
Angle $YXZ = \dots\dots\dots$ [2]

iii) Find the bearing of Y from X .

[1]

(6 marks)

6 (a)



A vertical flagpole, BD , stands on horizontal ground and is held by two ropes, AD and CD .

$AD = 15\text{m}$, $BC = 10.7\text{m}$ and angle $DAB = 38^\circ$.

Using trigonometry, calculate BD .

$BD = \dots\dots\dots\text{m}$

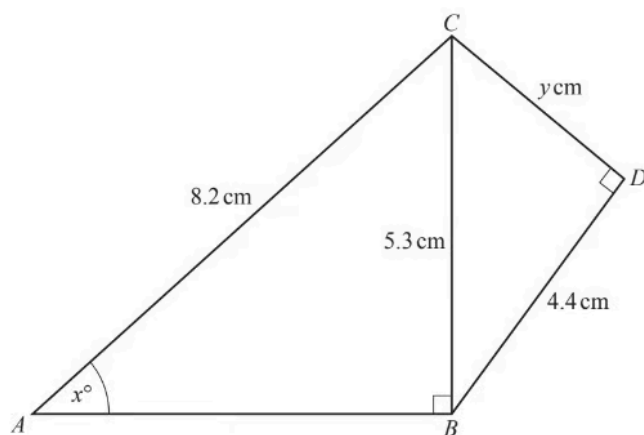
(2 marks)

(b) Calculate CD .

$CD = \dots\dots\dots$ m

(2 marks)

7 (a)



NOT TO
SCALE

Triangles ABC and BCD are both right-angled triangles.

Calculate the value of y .

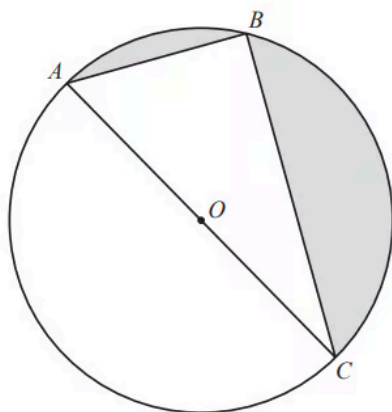
$y = \dots\dots\dots$

(3 marks)

(b) Calculate the value of x .

$x = \dots\dots\dots$

(2 marks)



NOT TO
SCALE

A , B and C are points on the circumference of a circle, centre O . Angle $ABC = 90^\circ$.

[1]

$AB = 20$ cm and $AC = 52$ cm.

i) Use trigonometry to calculate angle BAC .

Angle $BAC = \dots\dots\dots$ [2]

ii) Show that $BC = 48$ cm.

[2]

iii) Work out the area of triangle ABC .

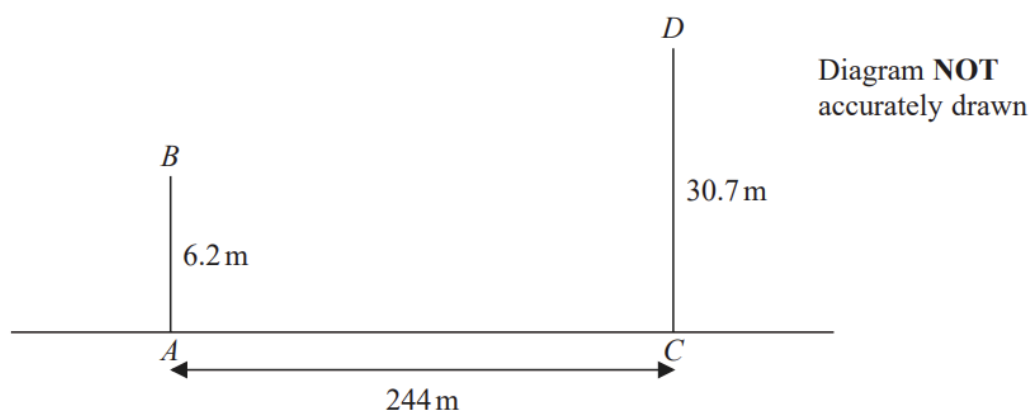
$\dots\dots\dots \text{cm}^2$ [2]

iv) Work out the total shaded area.

$\dots\dots\dots \text{cm}^2$ [3]

(9 marks)

- 9 The diagram shows two vertical phone masts, AB and CD , on horizontal ground.



$$AB = 6.2 \text{ m} \quad AC = 244 \text{ m} \quad CD = 30.7 \text{ m}$$

Work out the size of the angle of depression of B from D
Give your answer correct to one decimal place.

(3 marks)