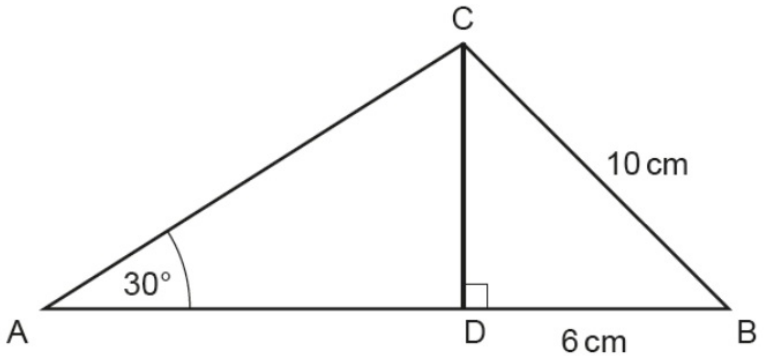
G46 - Trigonometry - Right angled missing sides

OCR

22 The diagram shows triangle ABC.
D is a point on AB such that DB = 6 cm.
BC = 10 cm, angle CAD = 30° and angle BDC = 90°.



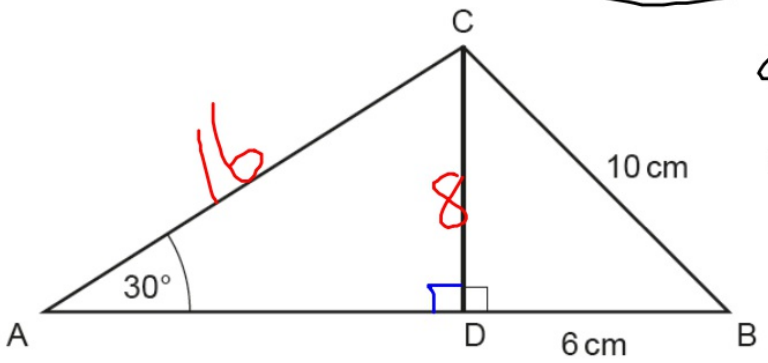
Not to scale

Work out the ratio length of AC : length of DB in its simplest form.

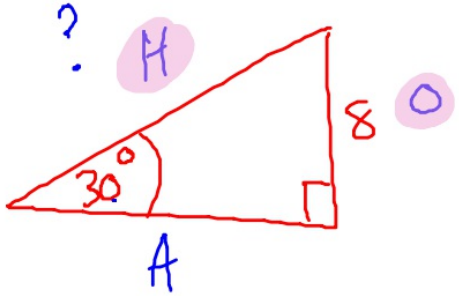
..... : ..... **[5]**

Created by W Neill

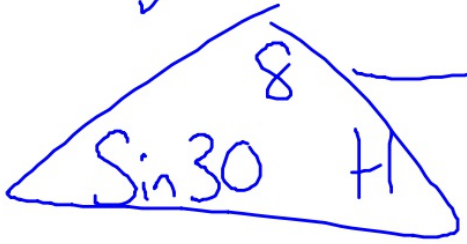
22 The diagram shows triangle ABC.
D is a point on AB such that DB = 6 cm.
BC = 10 cm, angle CAD = 30° and angle BDC = 90°.



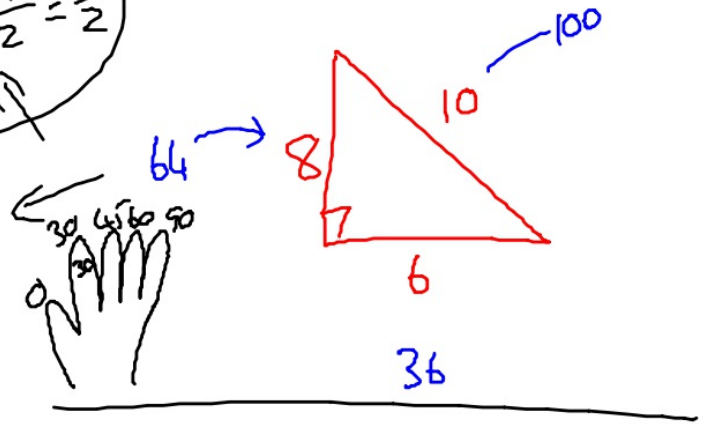
Work out the ratio length of AC : length of DB in its simplest form.



SOH CAH TOA



$\sin 30 \quad \frac{\sqrt{1}}{2} = \frac{1}{2}$



$$H = \frac{8}{\sin 30}$$

$$H = \frac{8}{0.5} = \frac{16}{1}$$

$$H = 16$$

16 : 6
8 : 3

8 : 3 ..... [5]

Created by W Neill

19 The angles in a triangle are in the ratio 1 : 2 : 3.

(a) Show that the triangle is a right-angled triangle. **[2]**

(b) The hypotenuse of the triangle is 15 cm long.

Calculate the length of the shortest side in the triangle.

(b) ..... cm **[4]**

Created by W Neill

19 The angles in a triangle are in the ratio 1 : 2 : 3.

(a) Show that the triangle is a right-angled triangle. **[2]**

180°

180° ... 1 : 2 : 3

÷6 ↓ 180° = 6 parts ÷6 ↓
30° 1 part

15cm

1 : 2 : 3

30 60 90°

Right angled as it has 90°

(b) The hypotenuse of the triangle is 15 cm long.

Calculate the length of the shortest side in the triangle.

O ?

60° 15cm H 30°

7

A

SOH CAH TOA

O

Sin 30 | 15

√1/2 = 1/2

30 45 60 90

1/2 of 15

1/2 x 15

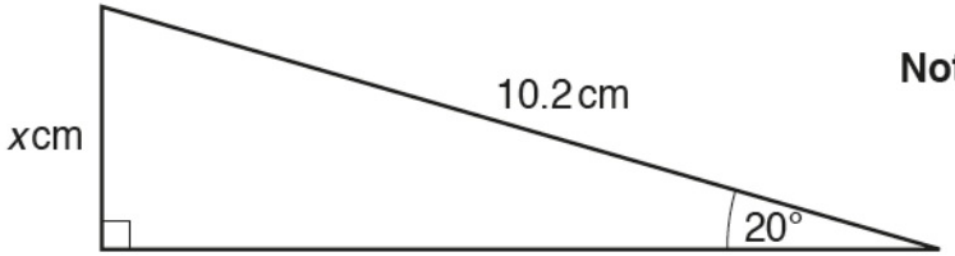
= 7.5

(b) ..... cm **[4]**

Video created by W Neill

21 Here is a right-angled triangle.

G46



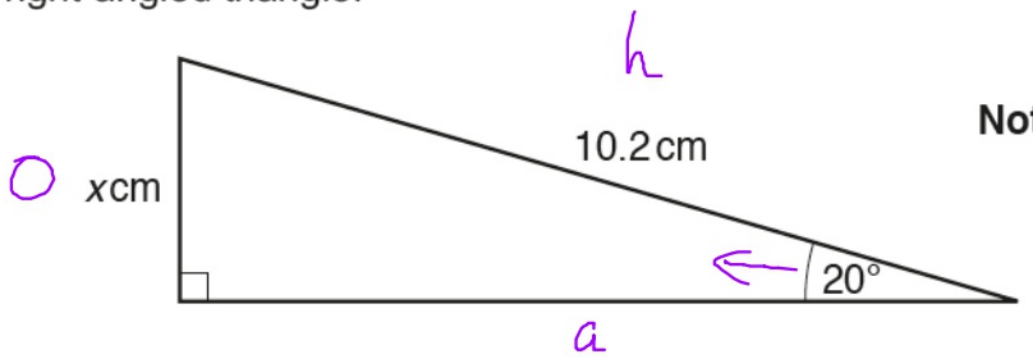
Not to scale

Use trigonometry to work out the value of x.

$x =$ ..... **[3]**

21 Here is a right-angled triangle.

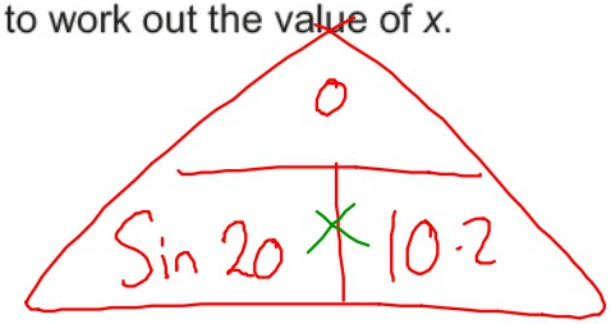
G46



Not to scale

SOH CAH TOA ✓

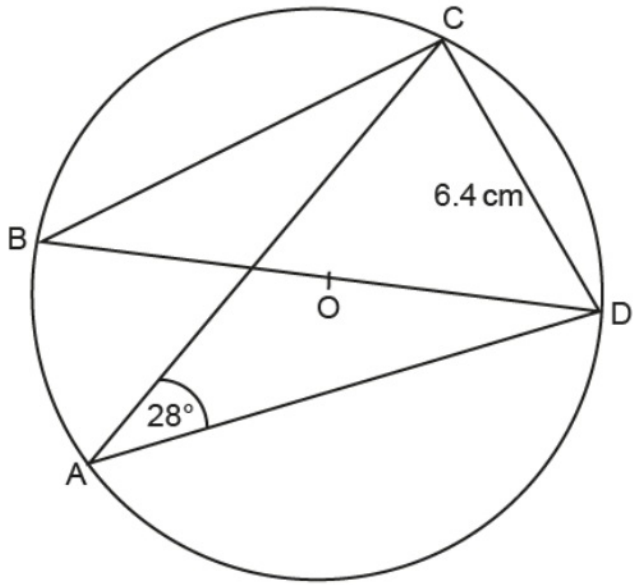
Use trigonometry to work out the value of x.



$x =$ 3.49cm ✓ ..... **[3]**

Created by W Neill

8 A, B, C and D are points on the circumference of a circle, centre O.



Not to scale

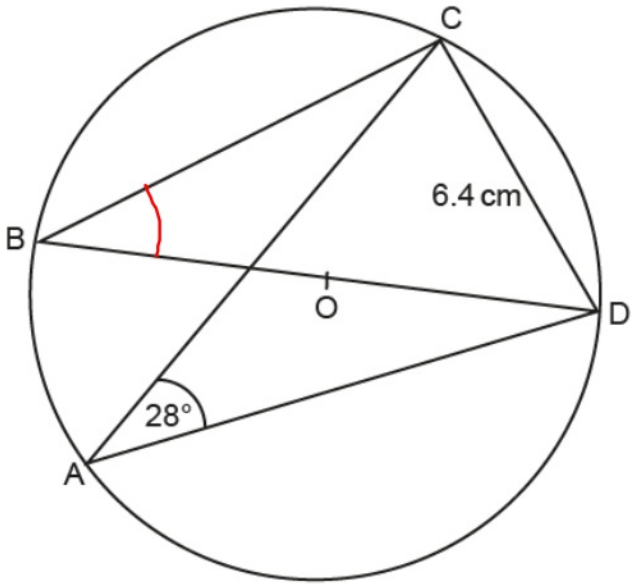
Angle CAD = 28° and CD = 6.4 cm.
BD is a diameter of the circle.

Calculate the area of the circle.

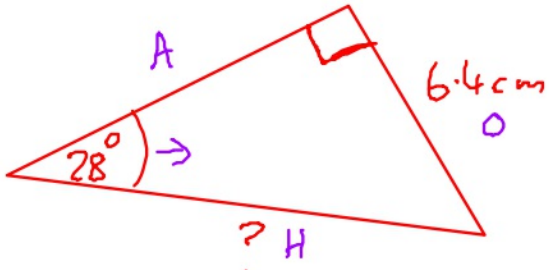
..... cm^2 **[5]**

Created by W Neill

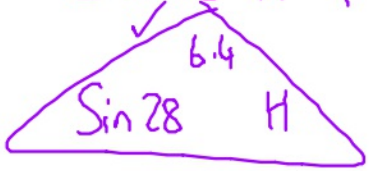
8 A, B, C and D are points on the circumference of a circle, centre O.



Not to scale



SOH CAH TOA



H = 13.63

Y

Diam

Angle CAD = 28° and CD = 6.4 cm.
BD is a diameter of the circle.

Calculate the area of the circle.

$R^2 \times \pi$

Area $= R^2 \times \pi$

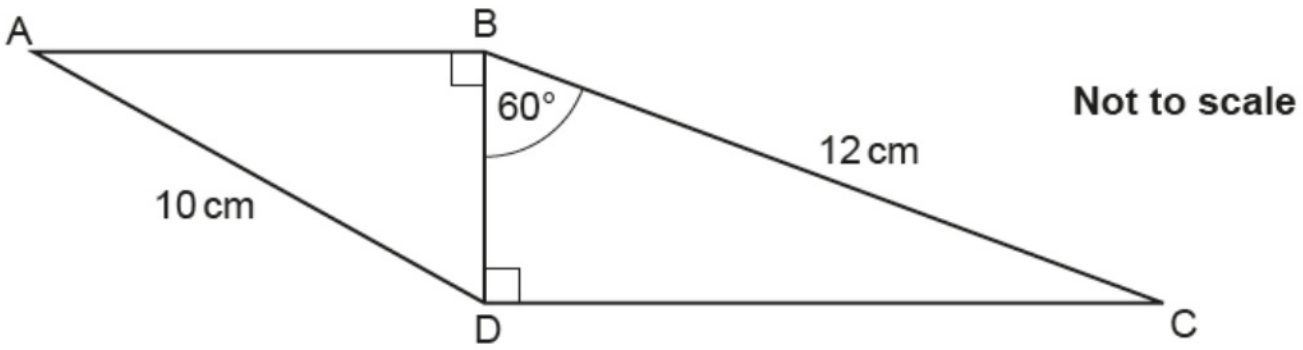
$= 6.186^2 \times \pi$

$= 146.0\ cm^2$ ✓

..... cm^2 **[5]**

11 The diagram shows two right-angled triangles ABD and BCD, sharing a common side BD.
AD = 10 cm, BC = 12 cm and angle DBC = 60°.

G46
G43

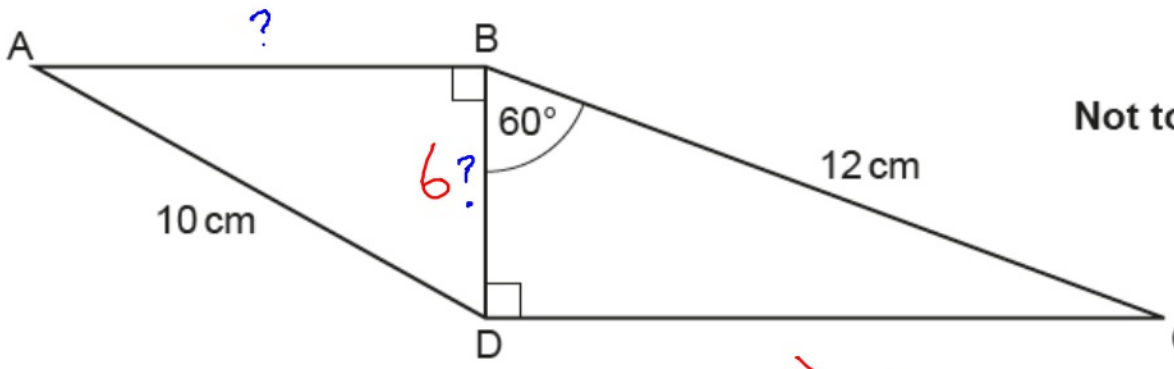


Work out the length of AB.

11 The diagram shows two right-angled triangles ABD and BCD, sharing a common side BD.
AD = 10 cm, BC = 12 cm and angle DBC = 60°.

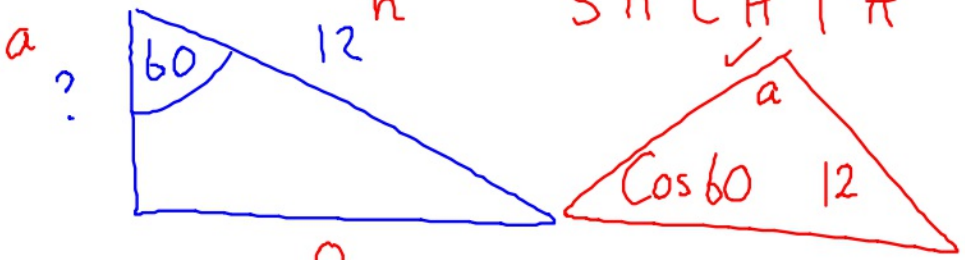
G46
G43
G48

Created by W Neill



Not to scale

Work out the length of AB.

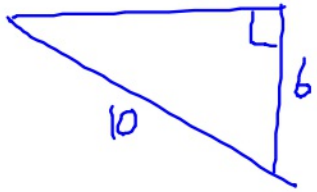


$\cos 60 = \frac{\sqrt{1}}{2} = \frac{1}{2} = 0.5$

$a = 0.5 \times 12$

$= 6$

AB =



Pythagoras

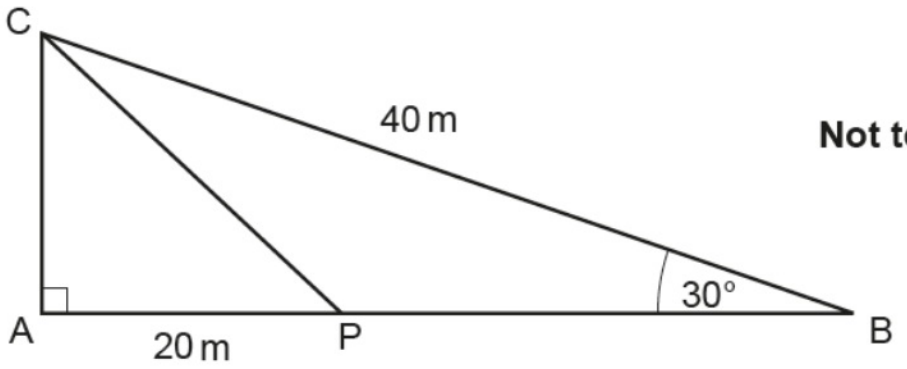
$10^2 - 6^2$

$100 - 36 = 64$

$\sqrt{64} = 8$ ✓

Video created by Will Neill

13 In the diagram, ABC is a right-angled triangle.
P is a point on AB.
BC = 40 m, AP = 20 m and angle ABC = 30 °.



Not to scale

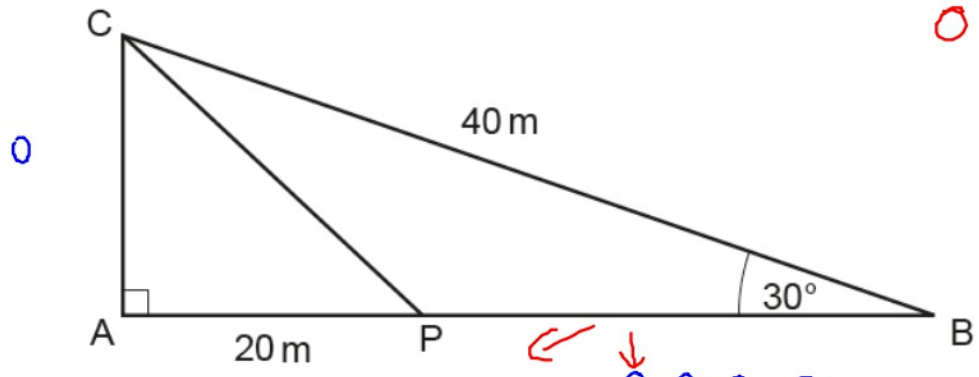
(a) Show that AC = 20 m. **[3]**

G46

G48

Video created by Will Neill

13 In the diagram, ABC is a right-angled triangle.
P is a point on AB.
BC = 40 m, AP = 20 m and angle ABC = 30 °.

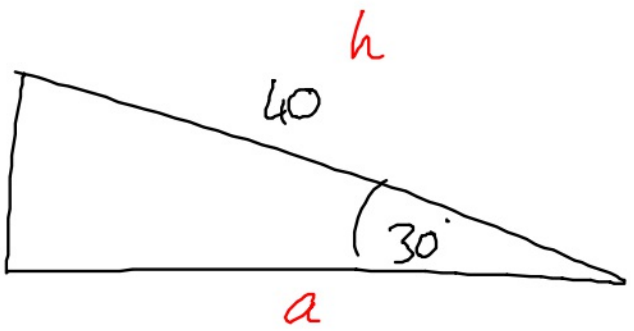


(a) Show that AC = 20 m. [3]

G46
G48

Sin 30°

√1/2 = 1/2



SOH CAH TOA

Sin 30° × 40

½ × 40

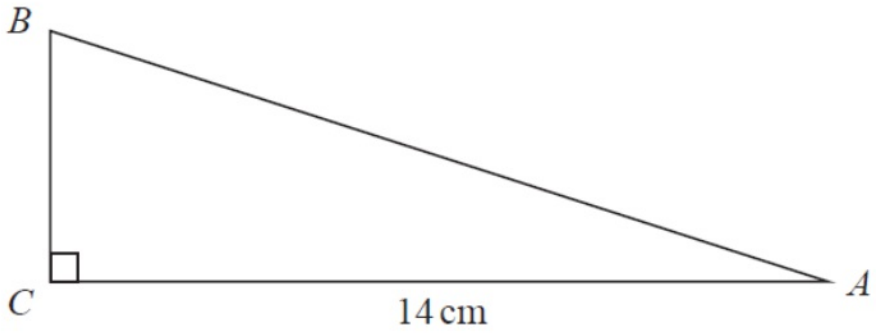
= 20m

Edexcel

Video Created by W Neill

25 ABC is a right-angled triangle.

R15a
G46



$AC = 14$ cm.
Angle $C = 90°$

size of angle B : size of angle $A = 3 : 2$

Work out the length of AB.
Give your answer correct to 3 significant figures.

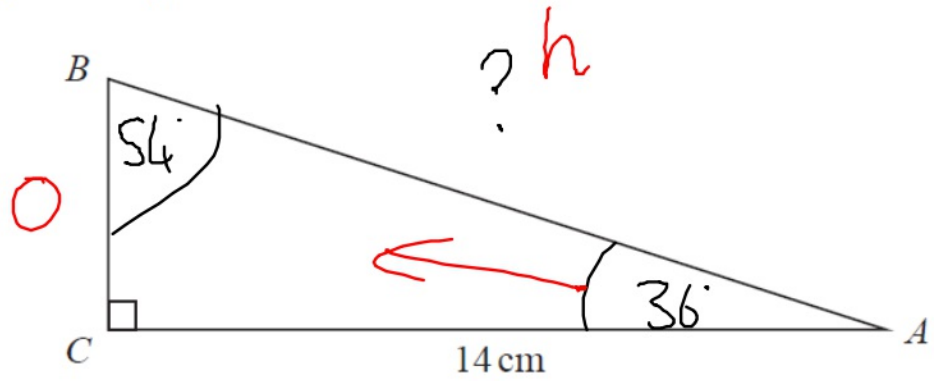
..... cm

(Total for Question 25 is 4 marks)

Video Created by W Neill

R15a
G46

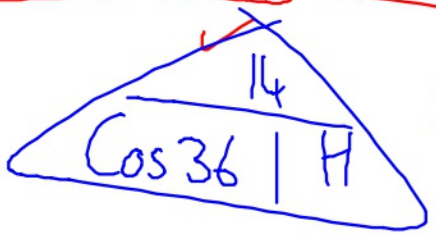
25 ABC is a right-angled triangle.



$AC = 14$ cm.
Angle $C = 90°$

size of angle B : size of angle A = 3 : 2

Work out the length of AB.
Give your answer correct to 3 significant figures.

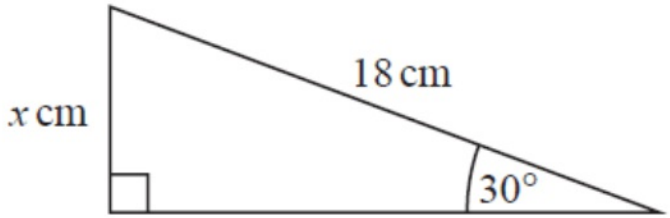


H =

17.3 cm

(Total for Question is 4 marks)

Video created by W Neill



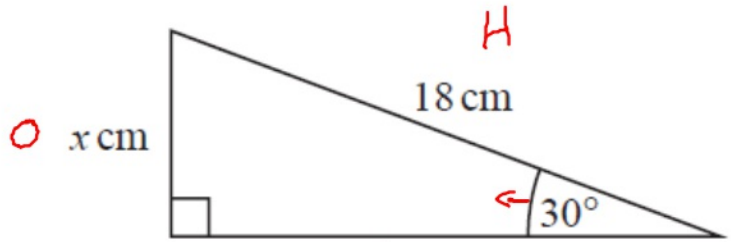
Work out the value of x.

.....

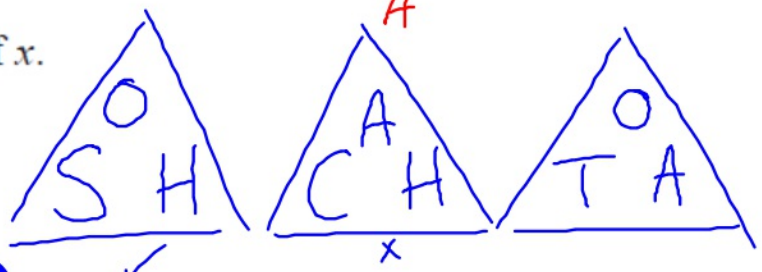
(Total for Question 22 is 2 marks)

6

Video created by W Neill



Work out the value of x.



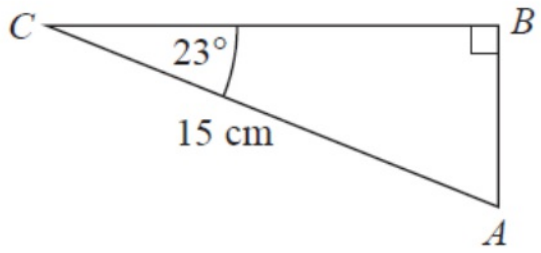
$O = \sin 30^\circ \times 18$

9cm ✓

(Total for Question is 2 marks)

Video created by W Neill

7 *ABC* is a right-angled triangle.



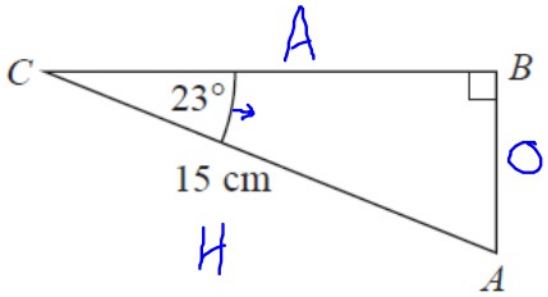
Calculate the length of *AB*.
Give your answer correct to 3 significant figures.

..... cm

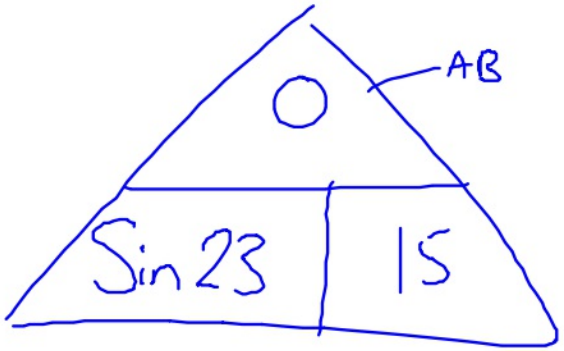
(Total for Question 7 is 2 marks)

Video created by W Neill

7 *ABC* is a right-angled triangle.



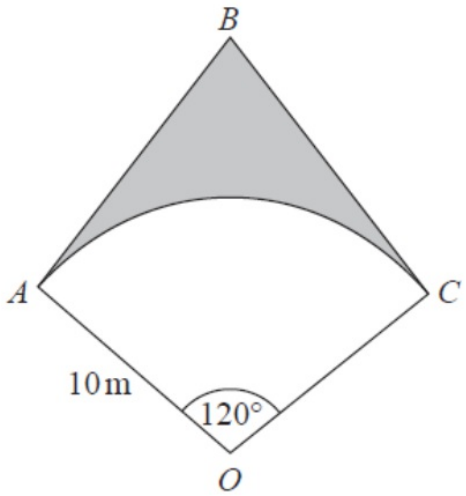
Calculate the length of *AB*.
Give your answer correct to 3 significant figures.



5·86 ..... cm

(Total for Question 7 is 2 marks)

20



OAC is a sector of a circle, centre *O*, radius 10 m.

BA is the tangent to the circle at point *A*.
BC is the tangent to the circle at point *C*.

Angle *AOC* = 120°

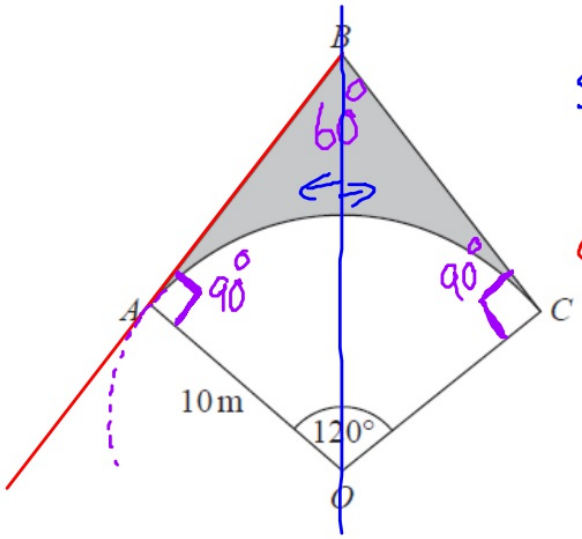
Calculate the area of the shaded region.
Give your answer correct to 3 significant figures.

..... m^2

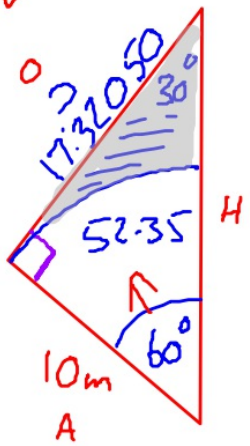
(Total for Question 20 is 5 marks)

20

Created by W Neill



SOH CAH TOA



OAC is a sector of a circle, centre *O*, radius 10 m.

BA is the tangent to the circle at point *A*.
BC is the tangent to the circle at point *C*.

Angle *AOC* = 120°

Calculate the area of the shaded region.
Give your answer correct to 3 significant figures.

Area of $\Delta = \frac{B \times H}{2} = 86.60254038\ m^2$

Area of sector = $\frac{R^2 \times \pi}{\text{full circle}} \div 6$

Shaded = full - white

= 86.602 - 52.35 = 34.24 x2

68.5 m^2

(Total for Question 20 is 5 marks)

Video Created by W Neill

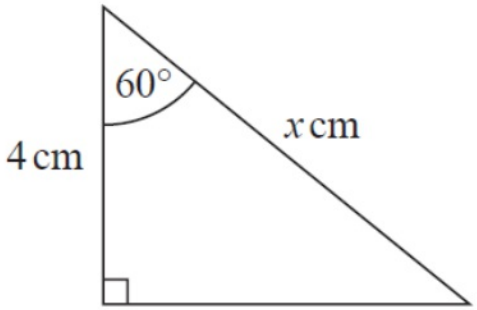
8 (a) Write down the exact value of tan 45°

G48

.....

(1)

Here is a right-angled triangle.



cos 60° = 0.5

(b) Work out the value of x.

G46

.....

(2)

Video Created by W Neill

8 (a) Write down the exact value of tan 45°

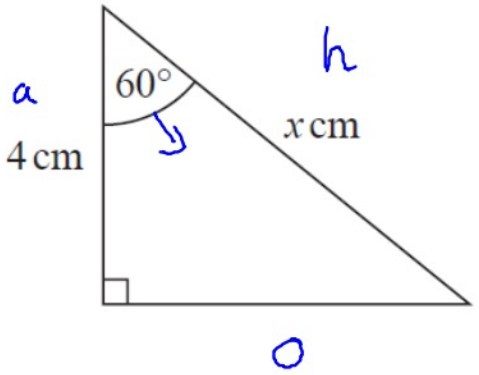
$\sqrt{\frac{2}{2}} = \sqrt{1}$

G48

1

(1)

Here is a right-angled triangle.



h

a

o

SOH CAH TOA

✓

4

Cos 60 h

cos 60° = 0.5 ✓

(b) Work out the value of x.

G46

$\frac{4}{0.5} = \frac{8}{1} = 8$

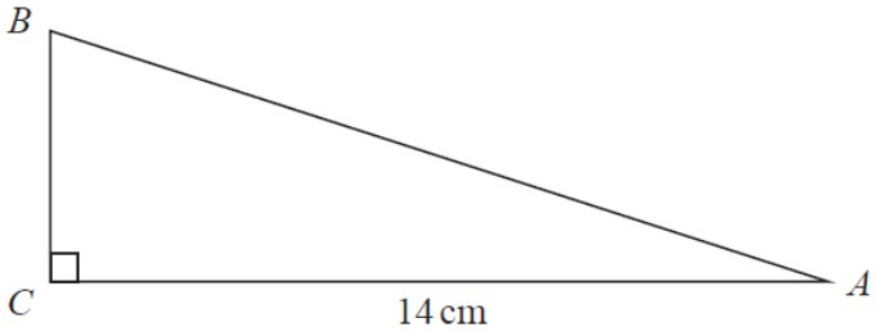
8 cm

(2) ✓

Video Created by W Neill

6 ABC is a right-angled triangle.

R15a
G46



$AC = 14$ cm.
Angle $C = 90°$

size of angle B : size of angle $A = 3 : 2$

Work out the length of AB.
Give your answer correct to 3 significant figures.

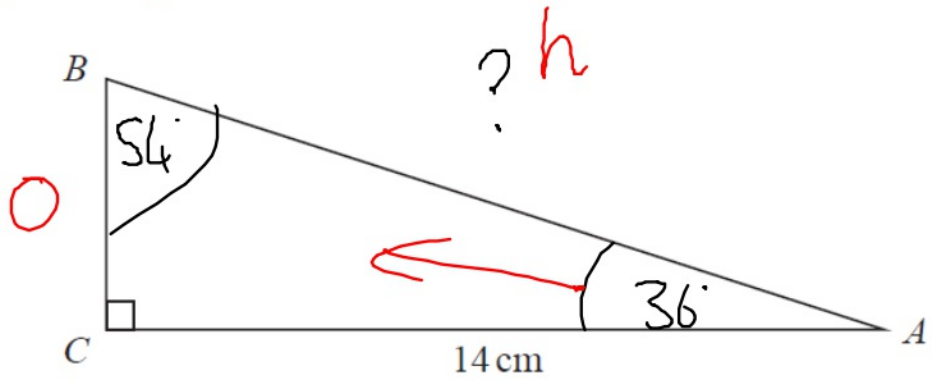
..... cm

(Total for Question is 4 marks)

Video Created by W Neill

6 ABC is a right-angled triangle.

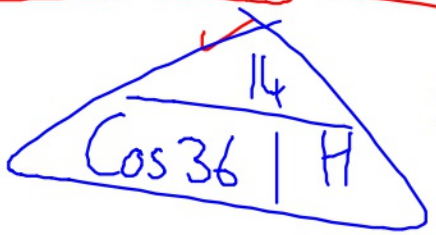
R15a
G46



$AC = 14$ cm.
Angle $C = 90°$

size of angle B : size of angle A = 3 : 2

Work out the length of AB.
Give your answer correct to 3 significant figures.



H =

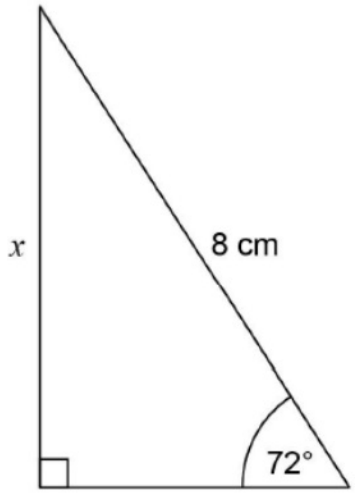
17.3 cm

(Total for Question is 4 marks)

AQA

Video created by W Neill

29 Use trigonometry to work out the length x.



Not drawn accurately

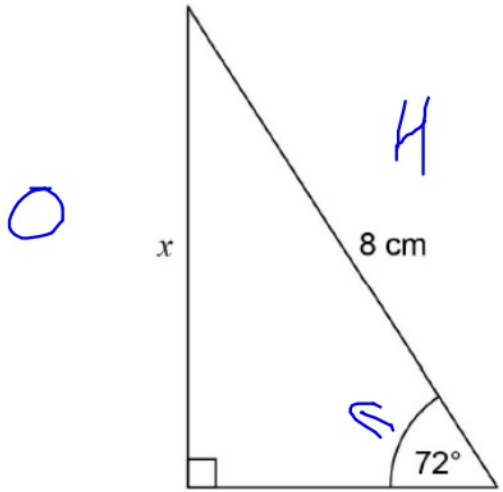
[2 marks]

Answer _____ cm

Video created by W Neill

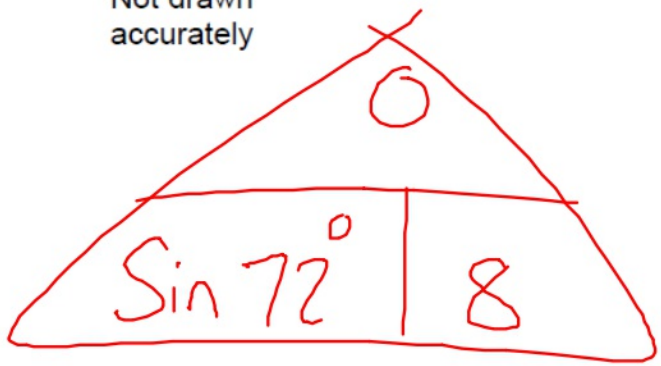
G46

Use trigonometry to work out the length x.



SOH CAH TOA

Not drawn accurately



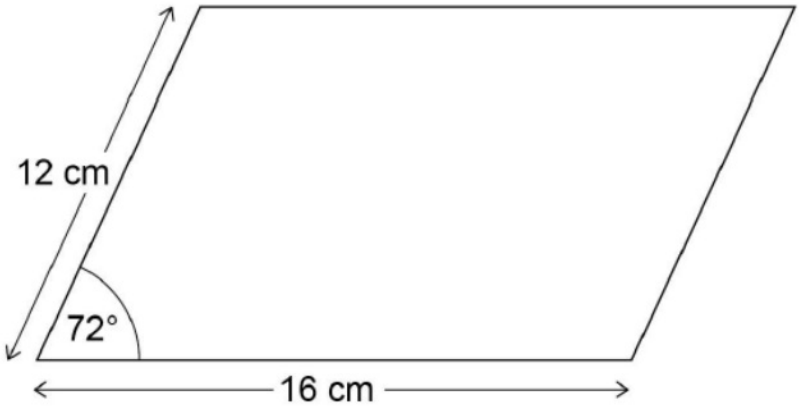
[2 marks]

Answer 7.61 cm

Video created by W Neill

17 Work out the area of the parallelogram.

G17
G46



Not drawn accurately

[3 marks]

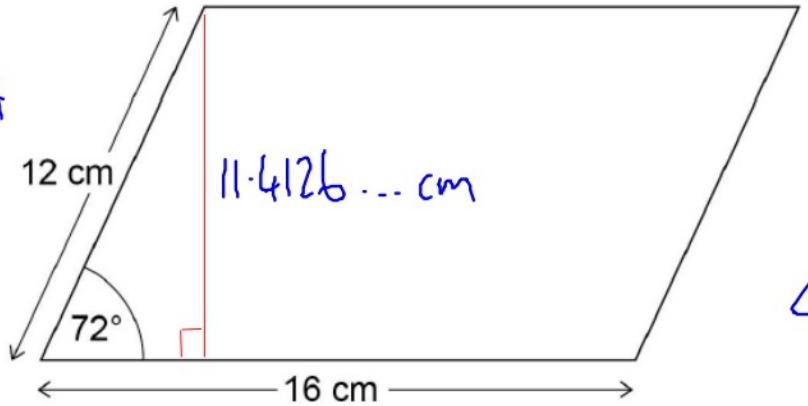
Answer _____ cm^2

Video created by W Neill

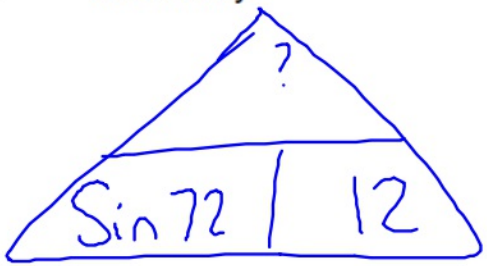
17 Work out the area of the parallelogram. Base x Height

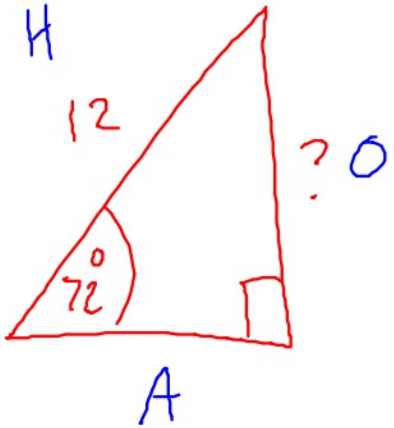
G17
G46

SOH CAH TOA ✓



Not drawn accurately





[3 marks]

Area = 11.4126 x 16

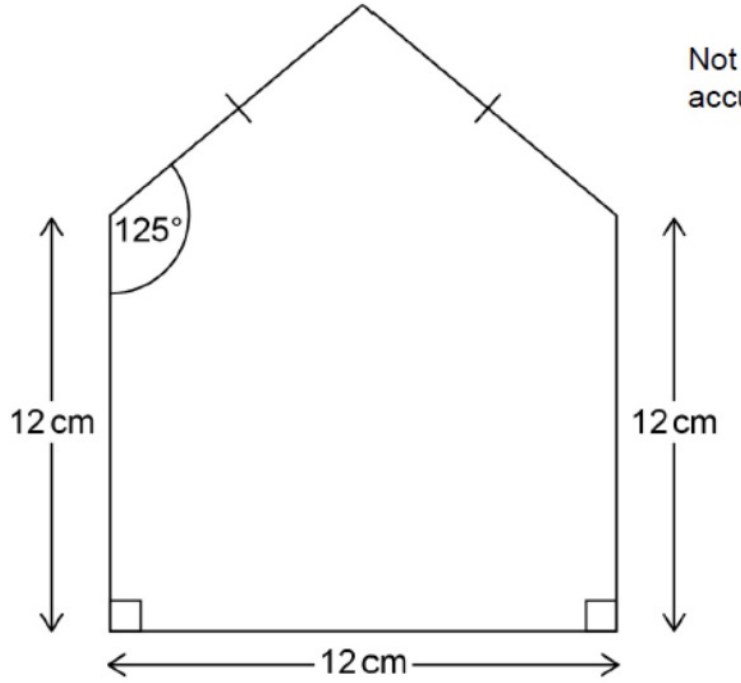
=

Answer 182.60 ✓ cm^2

Video created by W Neill

19 A pentagon is made from a square and an isosceles triangle.

G46



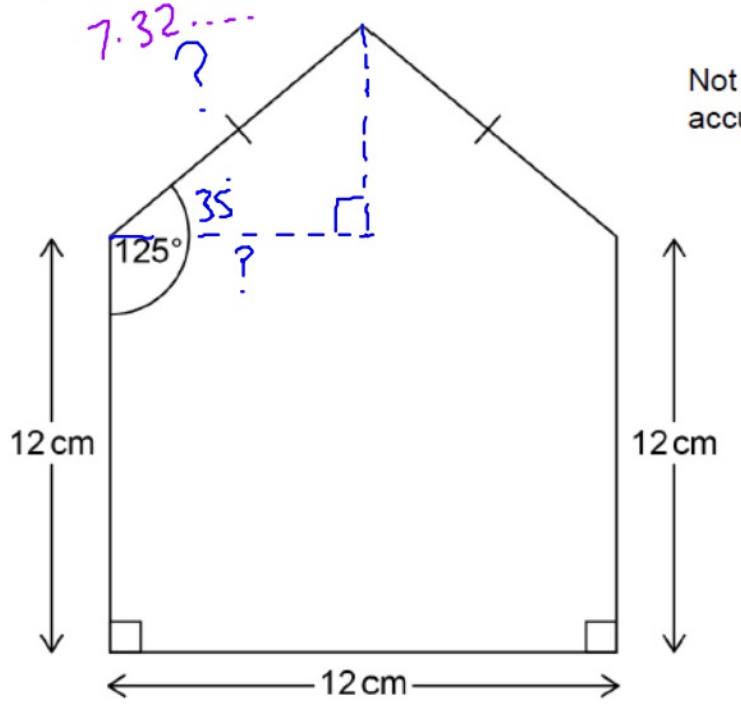
Work out the perimeter of the pentagon. **[4 marks]**

Answer _____ cm

Video created by W Neill

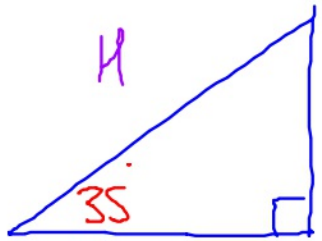
19 A pentagon is made from a square and an isosceles triangle.

G46

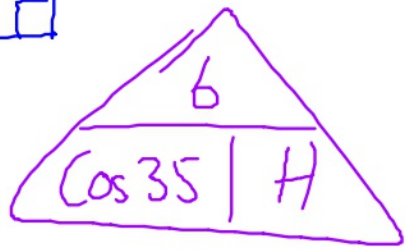


Not drawn accurately

SOH CAH TOA ✓



6cm
A



H = 7.32... cm

12+12+12+7.32...+7.32...

=

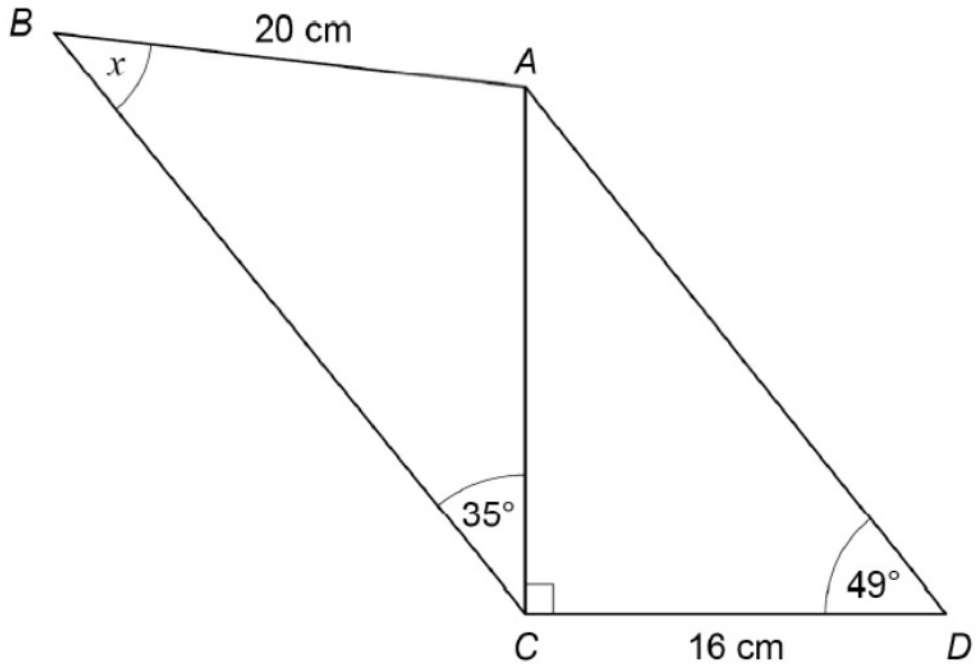
Work out the perimeter of the pentagon. **[4 marks]**

Answer 50.65 ✓ cm

Video created by W Neill

25 *ABC* and *ACD* are triangles.

G46
G57



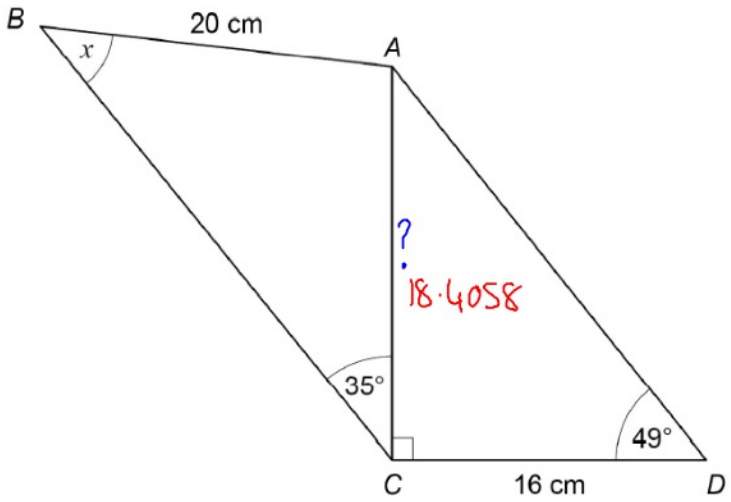
Work out the size of angle x. **[5 marks]**

Answer _____ degrees

Video created by W Neill

25 *ABC* and *ACD* are triangles.

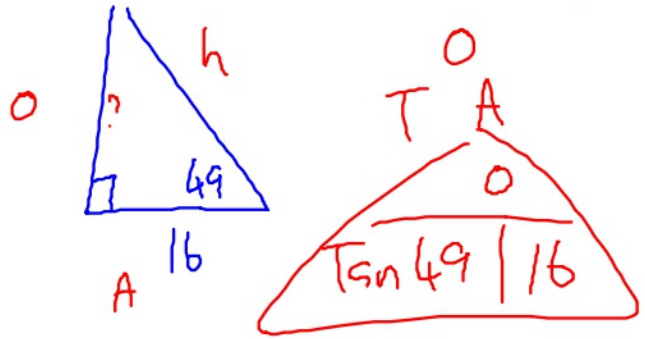
G46
G57

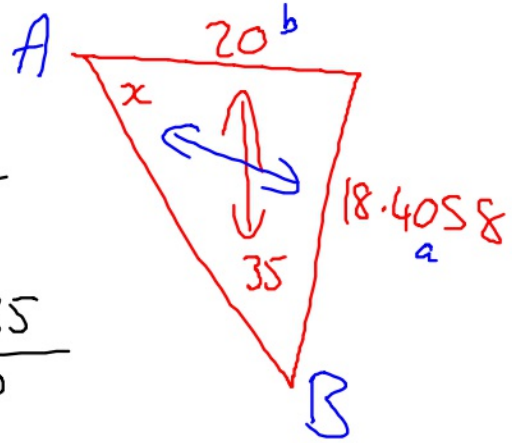


Not drawn accurately

Work out the size of angle x.

[5 marks]





$$\frac{\sin A}{a} = \frac{\sin B}{b}$$

$$\frac{\sin A}{18.4058} = \frac{\sin 35}{20}$$

$$\sin A = 0.527$$

$$A = \sin^{-1} 0.527$$

Answer 31.9° degrees