



EXAM PAPERS PRACTICE

GCSE OCR Math J560

SOHCAHTOA

Answers

*"We will help you to
achieve A Star "*



Answer 1

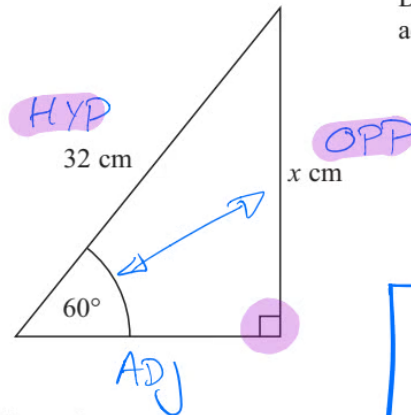


Diagram NOT accurately drawn

Calculate the value of x .
Give your answer correct to 3 significant figures.

$$\sin \theta = \frac{\text{OPP}}{\text{HYP}}$$

$$32 \times \sin 60 = \frac{x}{32} \times 32$$

$$x = 32 \times \sin 60$$

$$= \underline{\underline{27.7 \text{ cm}}}$$

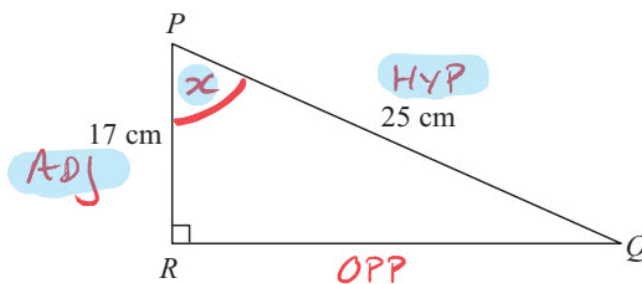
SOH CAH TOA

$$\sin \theta = \frac{\text{OPP}}{\text{HYP}}$$
$$\cos \theta = \frac{\text{ADJ}}{\text{HYP}}$$
$$\tan \theta = \frac{\text{OPP}}{\text{ADJ}}$$

CHECK AT THE TOP OF CALCULATOR
SCREEN FOR "D" OR "DEG".



Answer 2



PQR is a right-angled triangle.

$PR = 17$ cm

$PQ = 25$ cm

Work out the size of angle RPQ .

Give your answer correct to 1 decimal place.

$$\cos x = \frac{17}{25} \quad \text{"SHIFT cos"}$$

$$x = \cos^{-1}\left(\frac{17}{25}\right)$$

$$x = \underline{\underline{47.2^\circ}}$$

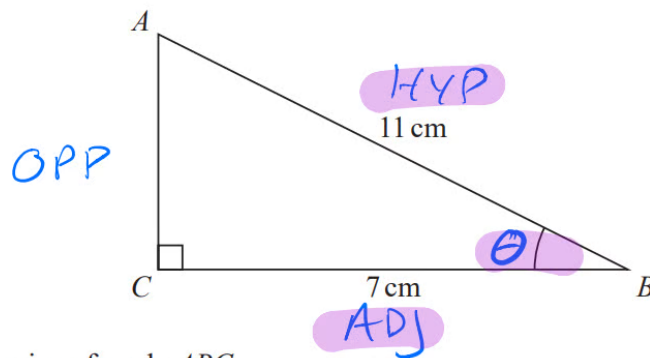
SOHCAHTOA

$$\sin \theta = \frac{\text{OPP}}{\text{HYP}}$$
$$\cos \theta = \frac{\text{ADJ}}{\text{HYP}}$$
$$\tan \theta = \frac{\text{OPP}}{\text{ADJ}}$$



Answer 3

ABC is a right-angled triangle.



- (a) Work out the size of angle ABC .
Give your answer correct to 1 decimal place.

$$\cos \theta = \frac{\text{ADJ}}{\text{HYP}}$$

$$\cos \theta = \frac{7}{11}$$

$$\theta = \cos^{-1}\left(\frac{7}{11}\right)$$

$$\theta = 50.4788\dots$$

↓
25
Rounds Up

$$\theta = \underline{50.5^\circ}$$

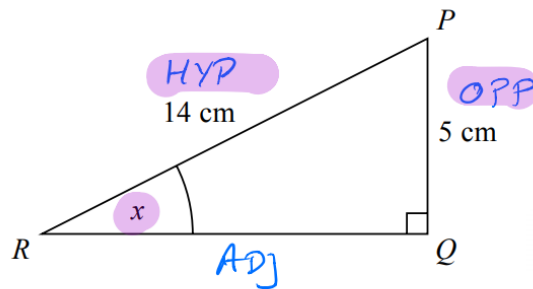
SOHCAHTOA

$$\sin \theta = \frac{\text{OPP}}{\text{HYP}}$$
$$\cos \theta = \frac{\text{ADJ}}{\text{HYP}}$$
$$\tan \theta = \frac{\text{OPP}}{\text{ADJ}}$$



Answer 4

PQR is a right-angled triangle.



Work out the size of the angle marked x .
Give your answer correct to 1 decimal place.

$$\sin \theta = \frac{\text{OPP}}{\text{HYP}}$$

$$\sin x = \frac{5}{14}$$

$$x = \sin^{-1}\left(\frac{5}{14}\right)$$

$$= 20.9248\dots$$

↑ ↓
< 5
Round Down

$$= \underline{\underline{20.9^\circ}}$$

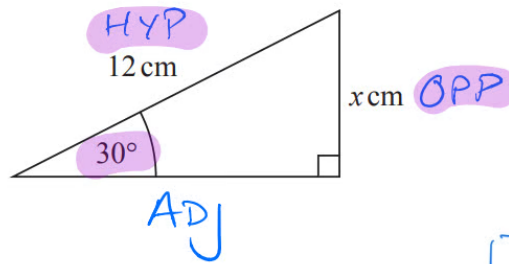
SOHCAHTOA

$$\sin \theta = \frac{\text{OPP}}{\text{HYP}}$$
$$\cos \theta = \frac{\text{ADJ}}{\text{HYP}}$$
$$\tan \theta = \frac{\text{OPP}}{\text{ADJ}}$$



Answer 5

(b)



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

$$\text{OPP} = \text{HYP} \times \sin \theta$$

$$x = 12 \times \sin 30$$

$$= 12 \times 0.5$$

$$= \underline{\underline{6 \text{ cm}}}$$



SOHCAHTOA

$$\sin \theta = \frac{\text{OPP}}{\text{HYP}}$$

$$\cos \theta = \frac{\text{ADJ}}{\text{HYP}}$$

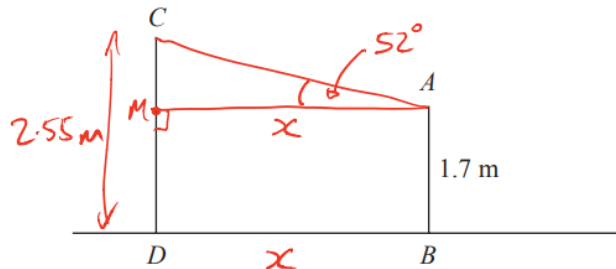
$$\tan \theta = \frac{\text{OPP}}{\text{ADJ}}$$





Answer 6

The diagram shows two vertical posts, AB and CD , on horizontal ground.



$AB = 1.7 \text{ m}$
 $CD : AB = 1.5 : 1$

The angle of elevation of C from A is 52°

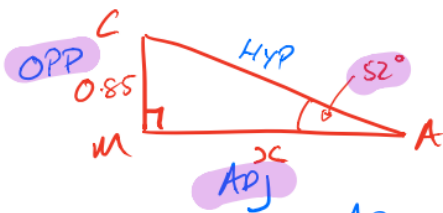
Calculate the length of BD .
Give your answer correct to 3 significant figures.

$CD : AB$

$1.5 : 1$
 $1.7 : ?$ $\times 1.7$

$CD = 1.5 \times 1.7 = 2.55 \text{ m}$

$CM = 2.55 - 1.7 = 0.85 \text{ m}$



$ADJ = \frac{OPP}{\tan \theta}$

$x = \frac{0.85}{\tan 52}$

$x = 0.66409 \dots$

↓
<5
Rounds Down

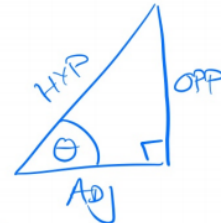
$x = 0.664 \text{ m}$

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$\sin \theta = \frac{OPP}{HYP}$

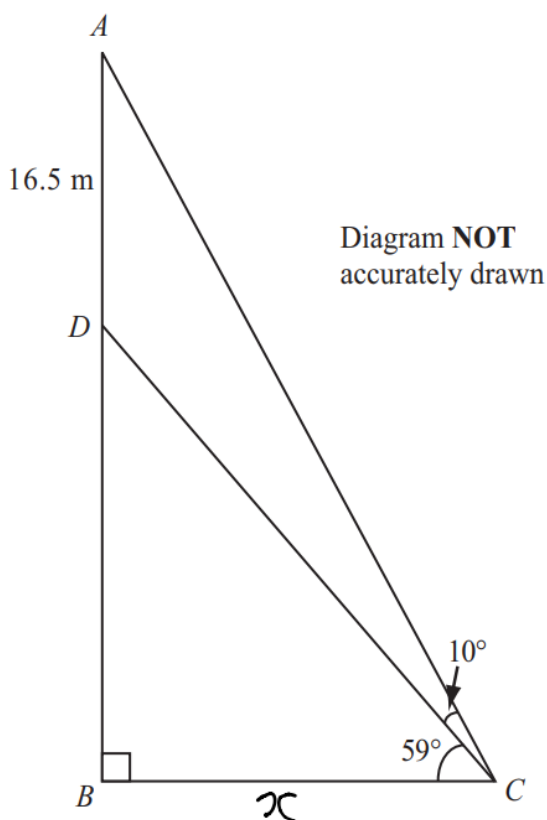
$\cos \theta = \frac{ADJ}{HYP}$

$\tan \theta = \frac{OPP}{ADJ}$





Answer 7



The diagram shows a vertical flagpole in Chennai, India.

The point A is at the top of the flagpole.

The point B is at the foot of the flagpole.

There is a platform at the point D on the flagpole.

B and C are points on horizontal ground.

$AD = 16.5$ m

The angle of elevation of A from C is 69°

The angle of elevation of D from C is 59°

Calculate the height, AB , of the flagpole.

Give your answer correct to 3 significant figures.

$$AB = 16.5 + DB$$

$$AB = x (\tan(10 + 59))$$

$$DB = x (\tan(59))$$

$$16.5 + DB = x (\tan(69))$$

$$BD + 16.5 = \frac{\tan(69)}{\tan(59)} (BD)$$

SOH CAHTOA

$$\left(\frac{\tan(69)}{\tan(59)} - 1 \right) BD = 16.5$$

$$0.565... BD = 16.5$$

$$\therefore BD = \frac{16.5}{0.565...}$$

$$BD \approx 29.189$$

$$AB \approx \underline{\underline{45.7}}$$



Answer 8

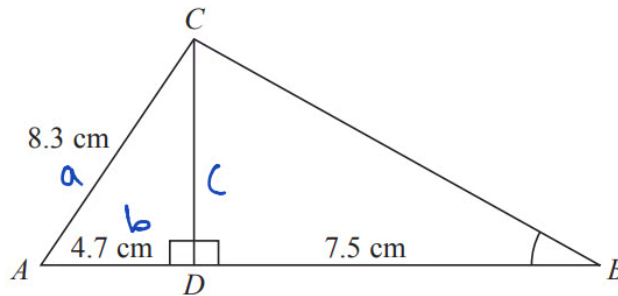


Diagram **NOT** accurately drawn

The diagram shows triangle ABC .

D is the point on AB , such that CD is perpendicular to AB .

$AC = 8.3$ cm.

$AD = 4.7$ cm.

$BD = 7.5$ cm.

Calculate the size of angle ABC .

Give your answer correct to 1 decimal place.

$$AC^2 = CD^2 + AD^2 \quad \sqrt{8.3^2 - 4.7^2} = c = 6.841... \quad (\text{using Pythagoras})$$

S^oH C^aH T^oa

Using tan with CD as the opposite angle and DB and the adjacent

$$\tan(x) = 6.84 / 7.5$$

$$X = \arctan(6.84/7.5)$$

$$X = 42.4$$

42.4 °
.....



Answer 9

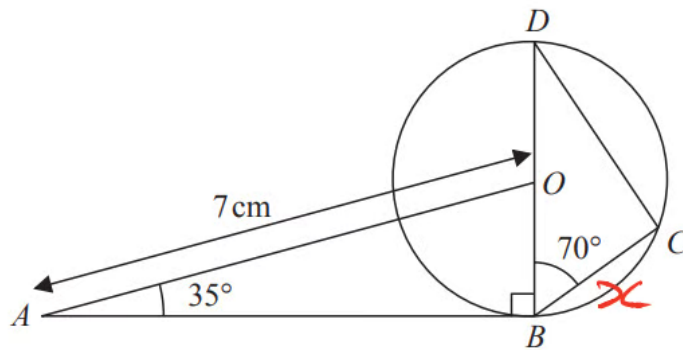


Diagram **NOT**
accurately drawn

B , C and D are points on the circumference of a circle, centre O .
 BOD is a diameter of the circle.

$AO = 7$ cm Angle $ABO = 90^\circ$ Angle $OAB = 35^\circ$ Angle $DBC = 70^\circ$

*(a) Explain why angle BCD is 90°

THE ANGLE IN A SEMICIRCLE IS 90° .



Answer 10

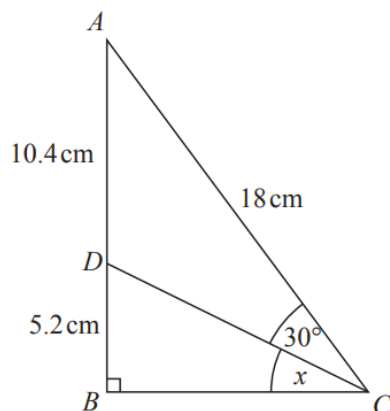


Diagram NOT accurately drawn

ABC is a right-angled triangle.
 D is a point on AB .

Angle $ACD = 30^\circ$
 $AD = 10.4$ cm
 $DB = 5.2$ cm
 $AC = 18$ cm

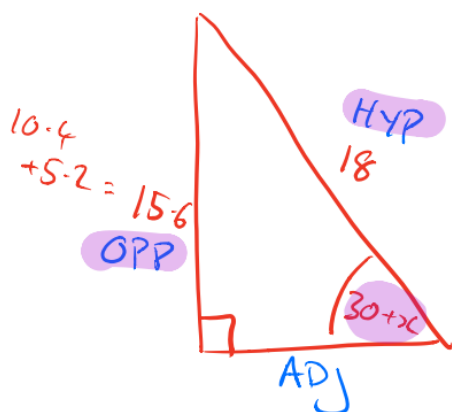
Work out the size of the angle marked x .
Give your answer correct to 1 decimal place.

SOHCAHTOA

$$\sin \theta = \frac{\text{OPP}}{\text{HYP}}$$

$$\cos \theta = \frac{\text{ADJ}}{\text{HYP}}$$

$$\tan \theta = \frac{\text{OPP}}{\text{ADJ}}$$



$$\sin \theta = \frac{\text{OPP}}{\text{HYP}}$$

$$\sin(30+x) = \frac{15.6}{18}$$

$$30+x = \sin^{-1}\left(\frac{15.6}{18}\right)$$

$$-30 \qquad -30$$

$$x = \sin^{-1}\left(\frac{15.6}{18}\right) - 30$$

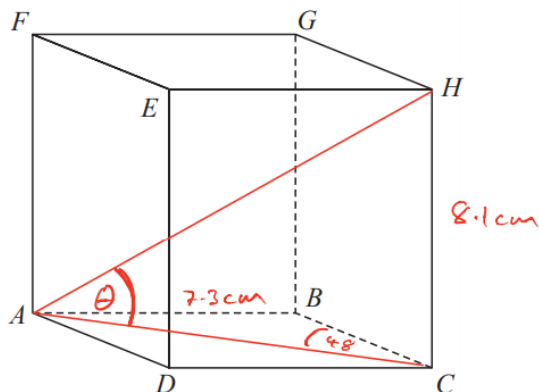
$$x = 30.073\dots$$

$$x = \underline{30.1^\circ} \quad \begin{matrix} \downarrow & \downarrow \\ & \geq 5 \\ & \text{Rounds Up} \end{matrix}$$



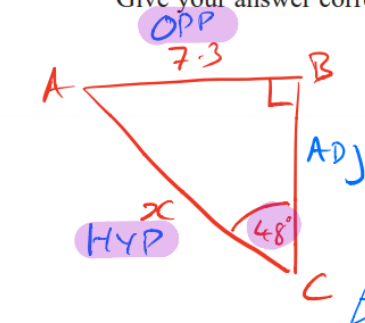
Answer 11

ABCDEFGH is a cuboid.



$AB = 7.3 \text{ cm}$
 $CH = 8.1 \text{ cm}$
Angle $BCA = 48^\circ$

Find the size of the angle between AH and the plane $ABCD$.
Give your answer correct to 1 decimal place.

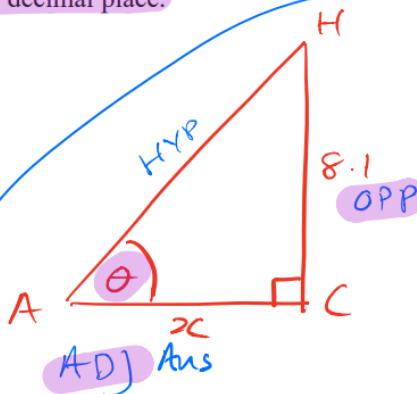


$$\text{HYP} = \frac{\text{OPP}}{\sin \theta}$$

$$x = \frac{7.3}{\sin 48}$$

$$= 9.823...$$

Ans



$$\tan \theta = \frac{\text{OPP}}{\text{ADJ}}$$

$$\tan \theta = \frac{8.1}{\text{Ans}}$$

$$\theta = \tan^{-1} \left(\frac{8.1}{\text{Ans}} \right)$$

$$\theta = 39.50849...$$

Round Down...

$$\theta = \underline{\underline{39.5^\circ}}$$

SOHCAHTOA

$$\sin \theta = \frac{\text{OPP}}{\text{HYP}}$$

$$\cos \theta = \frac{\text{ADJ}}{\text{HYP}}$$

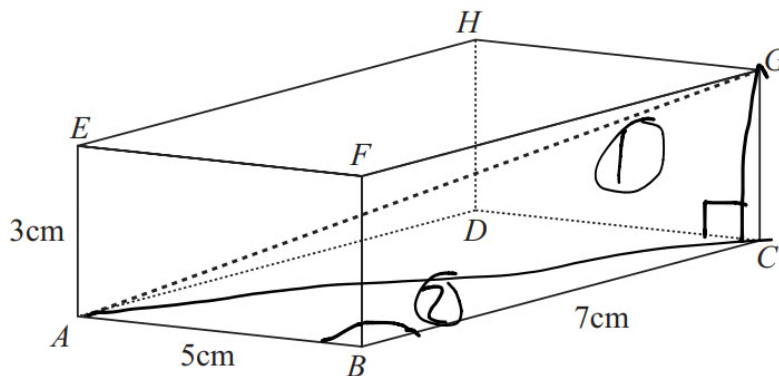
$$\tan \theta = \frac{\text{OPP}}{\text{ADJ}}$$





Answer 12

Diagram **NOT**
accurately drawn



The diagram shows a cuboid $ABCDEFGH$.

$$AB = 5\text{cm}$$

$$BC = 7\text{cm}$$

$$AE = 3\text{cm}$$

- (a) Calculate the length of AG .
Give your answer correct to 3 significant figures.

$$AG^2 = AC^2 + GC^2$$

$$AC^2 = AB^2 + BC^2 \quad \therefore AG^2 = AB^2 + BC^2 + GC^2$$

$$AG = \sqrt{5^2 + 7^2 + 3^2} = \sqrt{83}$$

$$\approx 9.1 \text{ cm}$$



Answer 13

The diagram shows a pyramid with a horizontal rectangular base $PQRS$.

$PQ = 16$ cm.

$QR = 10$ cm.

M is the midpoint of the line PR .

The vertex, T , is vertically above M .

$MT = 15$ cm.

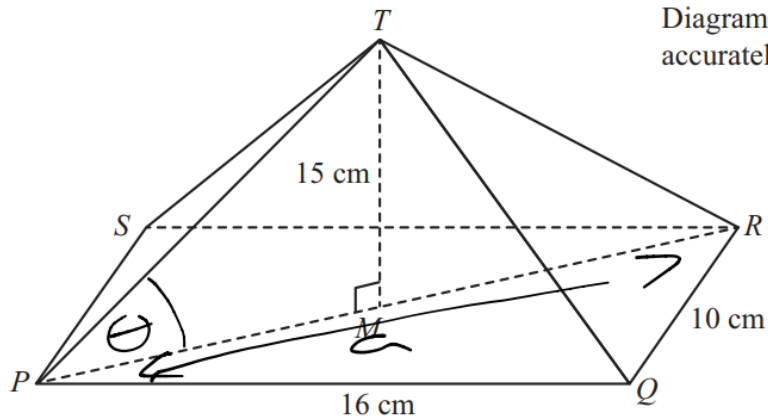


Diagram **NOT**
accurately drawn

Calculate the size of the angle between TP and the base $PQRS$.

Give your answer correct to 1 decimal place.

$$a^2 = 16^2 + 10^2$$

$$a^2 = \sqrt{16^2 + 10^2}$$

$$\sin \theta \quad \cos \theta \quad \tan \theta$$

$$\tan \theta = \frac{15}{\left(\frac{\sqrt{16^2 + 10^2}}{2}\right)} = \frac{15}{9.43\dots} \quad \therefore \theta \approx \underline{57.8^\circ}$$

57.8 °



Answer 14

The diagram shows a triangular prism with a horizontal rectangular base $ABCD$.

$AB = 10$ cm. $BC = 7$ cm.

M is the midpoint of AD .

The vertex T is vertically above M .

$MT = 6$ cm.

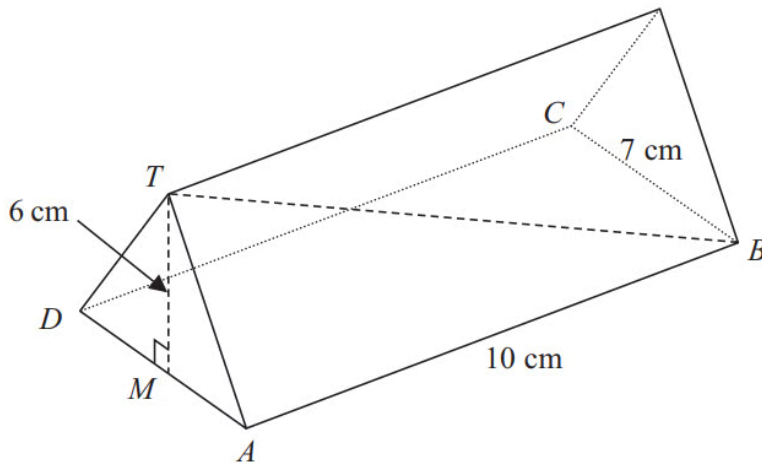


Diagram NOT
accurately drawn

Calculate the size of the angle between TB and the base $ABCD$.

Give your answer correct to 1 decimal place.

$$\begin{aligned} \text{MA is half BC} \\ \text{MA} = 3.5 \end{aligned}$$

$$\begin{aligned} \text{MB}^2 &= \text{MA}^2 + \text{AB}^2 \\ 112.25 &= 3^2 + 10^2 \\ \text{BM} &= \sqrt{112.25} \end{aligned}$$

$$X = \arctan(\text{TM} / \text{BM})$$

$$X = \arctan\left(\frac{6}{\sqrt{112.25}}\right)$$

$$X \approx 29.5^\circ$$

29.5 °



Answer 15

- (b) Find the size of the angle between the line FC and the plane $ABGF$.
Give your answer correct to 1 decimal place.

$$\text{SOH CAH TOA}$$

$$\sin(\theta) = \frac{12.5}{16}$$

$$\theta = \sin^{-1}\left(\frac{12.5}{16}\right) = 51.4^\circ$$

51.4°