



Unit 1 Revision Sheet E Pythagoras and Trig Foundation & Higher Questions

Q1.

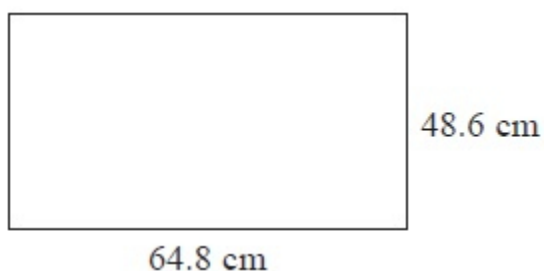


Diagram **NOT**
accurately drawn

A TV screen is rectangular.

The width of the rectangle is 64.8 cm and the height is 48.6 cm.

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

..... cm²
(3)

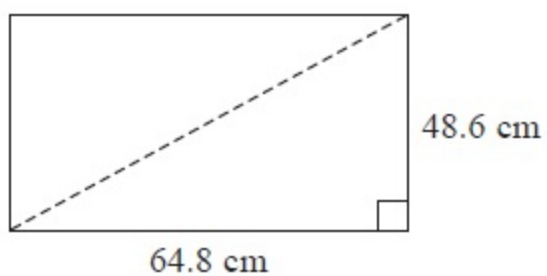


Diagram **NOT**
accurately drawn

The length of a diagonal of the rectangle gives the 'size' of the TV screen.

(b) Calculate the 'size' of the TV screen.

..... cm

(3)

(Total for Question is 6 marks)



Q2.

Here is an isosceles triangle.

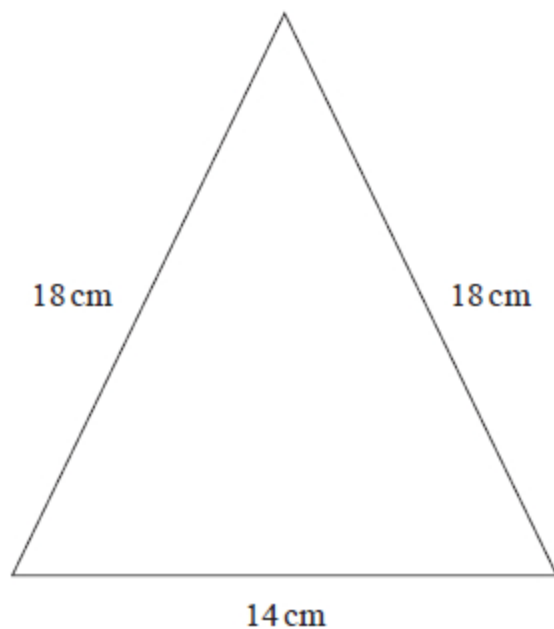


Diagram **NOT**
accurately drawn

Work out the area of the triangle.
Give your answer correct to 3 significant figures.

..... cm^2

(1)

(Total for question = 4 marks)



Q3.

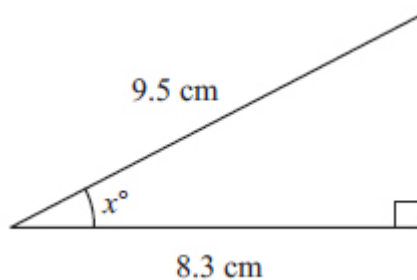


Diagram NOT
accurately drawn

Work out the value of x .
Give your answer correct to 1 decimal place.

$x =$

(Total for question = 3 marks)

Q4.

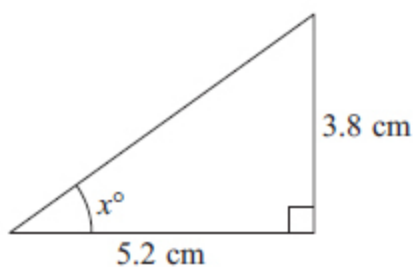


Diagram NOT
accurately drawn

Calculate the value of x .
Give your answer correct to 1 decimal place.

$x =$

(Total for question = 3 marks)



Q5.

The diagram shows an isosceles triangle.

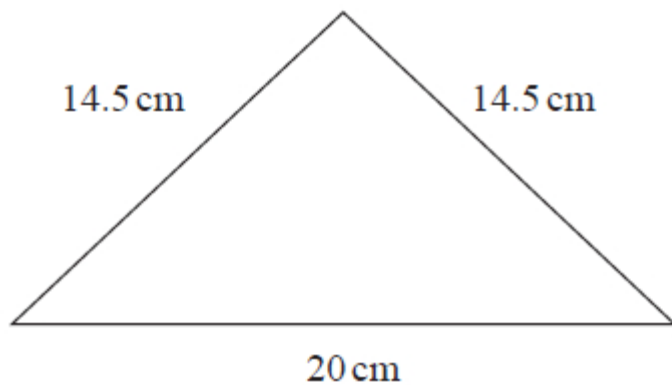


Diagram **NOT**
accurately drawn

Work out the area of the triangle.

..... cm²

(Total for question = 4 marks)



Q6.

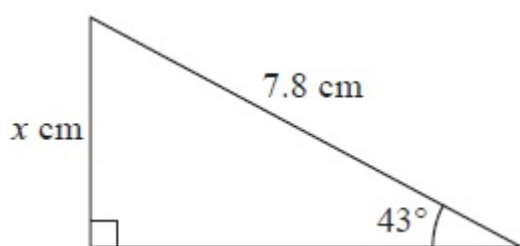


Diagram **NOT**
accurately drawn

Work out the value of x .

Give your answer correct to 3 significant figures.

$x =$

(Total for Question is 3 marks)



Q7.

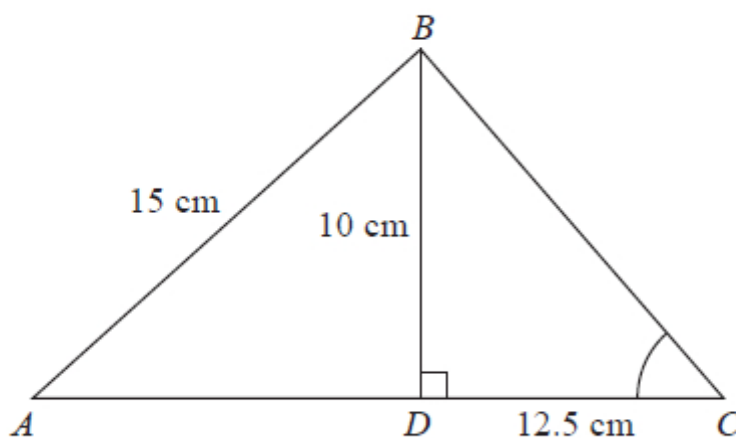


Diagram NOT
accurately drawn

ABC is a triangle.
The point D lies on AC .
Angle $BDC = 90^\circ$
 $BD = 10$ cm, $AB = 15$ cm and $DC = 12.5$ cm.

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

.....cm
(3)

- (b) Calculate the size of angle BCD .
Give your answer correct to 1 decimal place.

.....
(3)

(Total for question = 6 marks)



Q8.

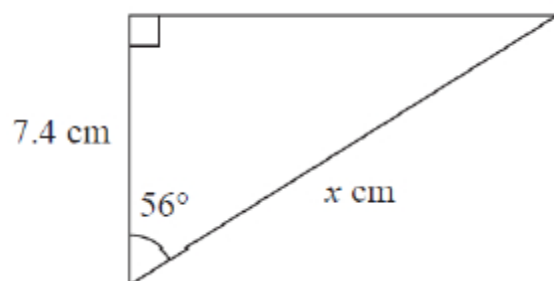


Diagram **NOT**
accurately drawn

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

$x =$

(Total for question = 3 marks)



Q9.

The diagram shows a shaded shape $ABCD$ made from a semicircle ABC and a right-angled triangle ACD .

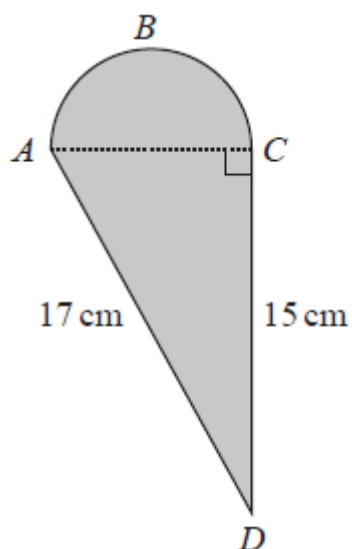


Diagram NOT
accurately drawn

AC is the diameter of the semicircle ABC .

Work out the perimeter of the shaded shape.
Give your answer correct to 3 significant figures.

..... cm

(Total for question = 5 marks)



Q10.

Here is a right-angled triangle.

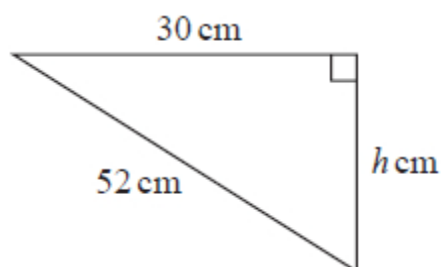


Diagram **NOT**
accurately drawn

Calculate the value of h .

Give your answer correct to 3 significant figures.

$h = \dots\dots\dots$

(Total for question = 3 marks)

Q11.

Here is a right-angled triangle.

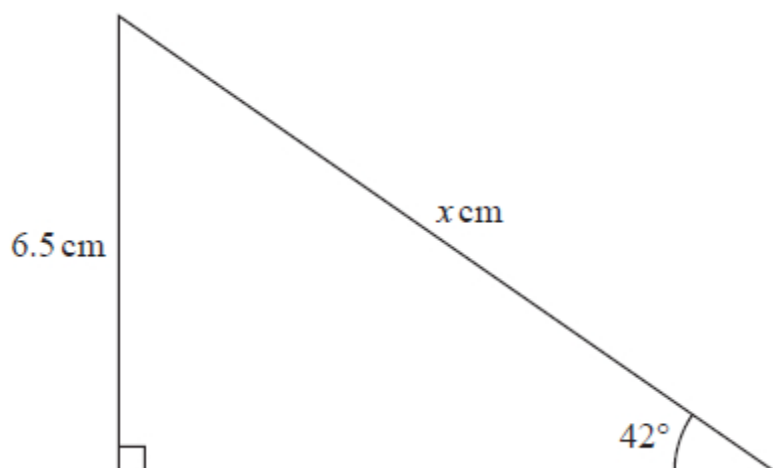


Diagram **NOT**
accurately drawn

Work out the value of x .

Give your answer correct to one decimal place.



$x =$

(Total for question = 3 marks)

Q12.

Write your answers in the spaces provided.

You must write down all the stages in your working.

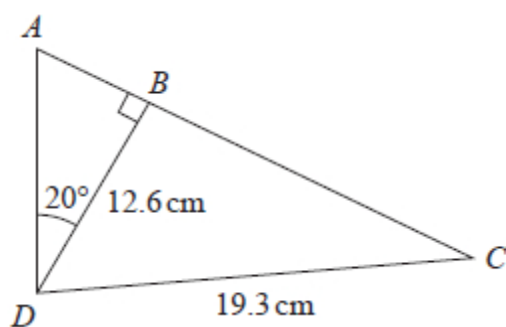


Diagram NOT
accurately drawn

ABC is a straight line.

Work out the length of AC .

Give your answer correct to 1 decimal place.

cm

(Total for question = 5 marks)



Q13.

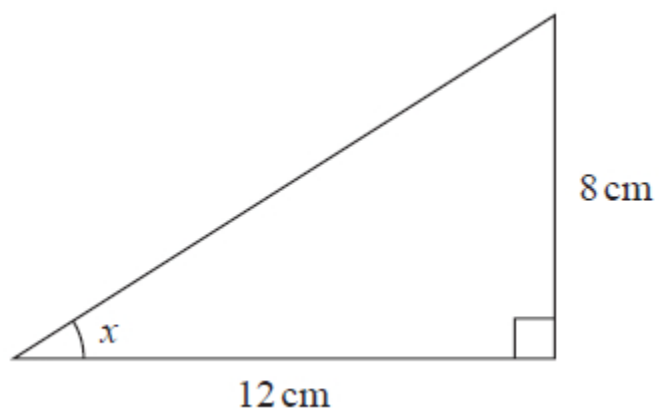


Diagram **NOT**
accurately drawn

Calculate the size of angle x .
Give your answer correct to 1 decimal place.

.....°

(Total for question = 3 marks)



Mark Scheme

Q1.

Question	Working	Answer	Mark	Notes
(a)	64.8×48.6		3	M1
		3150		A2 A1 for 3149.28 or this value rounded or truncated to 4 or 5 sig figs ie 3149, 3149.2, 3149
(b)	$64.8^2 + 48.6^2$ or 4199.04 + 2361.96 or 6561		3	M1 for squaring and adding
	$\sqrt{64.8^2 + 48.6^2}$			M1 (dep) for square root
		81		A1
Total 6 marks				

Q2.

Question	Working	Answer	Mark	Notes
	$18^2 - (14 \div 2)^2 (=275)$		4	M1 or M1 for $\cos x = \frac{7}{18}$ or $\sin y = \frac{7}{18}$ or $\cos z = \frac{18^2 + 18^2 - 14^2}{2 \times 18 \times 18}$
	$\sqrt{18^2 - (14 \div 2)^2}$ or $\sqrt{275}$ or $5\sqrt{11}$ or 16.5... or 16.6			M1 or M1 for $x = \cos^{-1}\left(\frac{7}{18}\right)$ or $x = 67.1...$ or $y = \sin^{-1}\left(\frac{7}{18}\right)$ or $y = 22.8...$ or $z = \cos^{-1}\left(\frac{18^2 + 18^2 - 14^2}{2 \times 18 \times 18}\right)$ or $z = 45.77...$
	$0.5 \times 14 \times "16.5..."$ or $35\sqrt{11}$			M1 or M1 for $0.5 \times 14 \times 18 \times \sin("67.1...")$ or $0.5 \times 18 \times 18 \times \sin(2 \times "22.8...")$ or $0.5 \times 18 \times 18 \times \sin("45.77...")$
		116		A1 116 – 116.1 NB Allow use of Hero's formula
Total 4 marks				
Alternative scheme				



	$25(25 - 18)(25 - 18)(25 - 14)(= 13475)$ oe	116	4	M2
	$\sqrt{13475}$ oe			M1
				A1
				Total 4 marks

Q3.

	use of cos		3	M1	cos must be selected for use in trig ratio NOT Cosine Rule	or M2 for sin and $\frac{\sqrt{21.36}}{9.5}$ following correct Pythagoras or M2 for tan and $\frac{\sqrt{21.36}}{8.3}$ following correct Pythagoras
	$\cos("x") = \frac{8.3}{9.5} (=0.87\dots)$ or $("x") = \cos^{-1}\left(\frac{8.3}{9.5}\right)$			M1		or correct Pythag and then correct use of sine or cosine rule with "21.36"
		29.1		A1	for ans rounding to 29.1 (29.1103...)	
					Total 3 marks	



Q4.

Question Number	Working	Answer	Mark	Notes		
	tan chosen		3	M1	for tan chosen	M1 for sin and $\frac{3.8}{\sqrt{41.48}}$
	$\frac{3.8}{5.2}$ or 0.7307...			A1	for $\frac{3.8}{5.2}$ or 0.7307... oe	following correct Pythagoras and A1 for 0.5900...
		36.2		A1	for answer rounding to 36.2	
				Total 3 marks		

Q5.

Q	Working	Answer	Mark	Notes	
	e.g. ($h^2 =$) $14.5^2 - 10^2$ or $\cos x = \frac{10}{14.5}$			M1	start to find height or angle
	e.g. ($h =$) $\sqrt{14.5^2 - 10^2}$ (=10.5) or ($x =$) $\cos^{-1}\left(\frac{10}{14.5}\right)$ (=46.3...)			M1	complete method to find height or angle
	e.g. $\frac{1}{2} \times 20 \times "10.5"$ or $\frac{1}{2} \times 20 \times 14.5 \times \sin("46.3...")$			M1	(dep on M1) method to find area
		105	4	A1	cao
				Total 4 marks	



Q6.

Question	Working	Answer	Mark	Notes	
	sin 43 used		3	M1	or M1 for correct statement of Sine Rule eg $\frac{7.8}{\sin 90^\circ} = \frac{x}{\sin 43^\circ}$
	$7.8 \sin 43^\circ$			M1	or M1 for $7.8 \cos 43^\circ$ (5.704...) and $7.8^2 - 5.704^2$ (28.298) M1 for $\sqrt{28.298}$
		5.32		A1	for awrt 5.32 (5.319587...)
Total 3 marks					

Q7.

Question	Working	Answer	Mark	Notes	
(a)	$15^2 - 10^2$ or $225 - 100$ or 125		3	M1	M2 for any complete and correct method
	$\sqrt{125}$ or $5\sqrt{5}$			M1 dep on M1	
		11.2		A1 awrt 11.2	
(b)	$\tan C = \frac{10}{12.5}$ or $\tan C = 0.8$		3	M1	M2 for any complete and correct method
	$\tan^{-1}\left(\frac{10}{12.5}\right)$ oe			M1	
		38.7		A1	Accept 38.6(5980825.....) rounded or truncated to at least 3 SF.
					Total 6 marks



Q8.

The correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method.

Question	Working	Answer	Mark	Notes
	$\cos 56^\circ = \frac{7.4}{x}$ or $7.4 = x \cos 56$ or $\sin(90 - 56) = \frac{7.4}{x}$ or $7.4 = x \sin(90 - 56)$		3	M1 Correct equation for x . e.g. $x^2 = 7.4^2 + (7.4 \tan 56^\circ)^2$
	$(x =) \frac{7.4}{\cos 56}$ or $\frac{7.4}{\sin(90-56)}$			M1 Correct expression for x . e.g. $x = \sqrt{7.4^2 + (7.4 \tan 56^\circ)^2}$
		13.2		A1 awrt 13.2
				Total 3 marks

Q9.

Question	Working	Answer	Mark	Notes
	$(AC^2 =) 17^2 - 15^2$		5	M1
	$(AC =) \sqrt{17^2 - 15^2} (= \sqrt{64} = 8)$			M1
	$\frac{\pi \times '8'}{2} (= 4\pi = 12.566...)$			M1 dep on M2 for $\frac{\pi \times '8'}{2}$ oe or 4π 12.5663...
	$'12.566...' + 15 + 17$			M1 for $'12.566' + 15 + 17$ and no additional values
		44.6		A1 for awrt 44.6
				Total 5 marks



Q10.

Q	Working	Answer	Mark	Notes
	$30^2 + h^2 = 52^2$ oe or $900 + h^2 = 2704$ $(h^2 =) 52^2 - 30^2 (=1804)$ or $(h^2 =) 2704 - 900 (=1804)$		3	M1 for applying Pythagoras theorem correctly
	$(h =) \sqrt{52^2 - 30^2} (= \sqrt{1804}) (= 42.47352\dots)$ or $(h =) \sqrt{2704 - 900} (= \sqrt{1804}) (= 42.47352\dots)$			M1 for square rooting
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	42.5		A1 awrt 42.5 or allow $2\sqrt{451}$
				Total 3 marks



Q11.

Q	Working	Answer	Mark	Notes
	$\sin 42 = \frac{6.5}{x}$ or $\frac{x}{\sin 90} = \frac{6.5}{\sin 42}$ oe or $\cos 48 = \frac{6.5}{x}$ [where $48 = 180 - 90 - 42$]		3	M1 or use of tan to find the horizontal side and then a correct first step in Pythagoras' theorem ie [base =] $\frac{6.5}{\tan 42}$ (= 7.21...) and $[x^2 =] 6.5^2 + "7.21..."^2$
	$[x =] \frac{6.5}{\sin 42}$ or $\frac{6.5 \sin 90}{\sin 42}$ or $[x =] \frac{6.5}{\cos 48}$ [where $48 = 180 - 90 - 42$]			M1 or complete method using Pythagoras $[x =] \sqrt{6.5^2 + "7.21..."}$ (If students give this statement with nothing before it they gain M2)
	<i>Working not required, so correct answer scores full marks (unless from obvious incorrect working)</i>	9.7		A1 accept 9.7 – 9.72
				Total 3 marks

Q12.

Question	Working	Answer	Mark	Notes
	$\tan 20^\circ = \frac{AB}{12.6}$ $(AB =) 12.6 \tan 20$ or 4.58(602...) or 4.6 $(BC^2 =) 19.3^2 - 12.6^2$ or 372.49 – 158.76 or 213(.73) $(BC =) \sqrt{19.3^2 - 12.6^2}$ or $\sqrt{"213.73"}$ or 14.6(195...)	19.2	5	M1 or for $AD = 12.6/\cos 20$ (=13.4..) and $12.6^2 + AB^2 = 13.4^2$ M1 or for $(AB =) \sqrt{13.4^2 - 12.6^2}$ M1 M1 A1 for 19.19 – 19.21



Q13.

Q		Working	Answer	Mark	Notes	
		$\tan x = \frac{8}{12}$ or $\sin x = \frac{8}{\sqrt{208}}$ or $\cos x = \frac{12}{\sqrt{208}}$ $x = \tan^{-1}\left(\frac{8}{12}\right)$ or $\sin^{-1}\left(\frac{8}{\sqrt{208}}\right)$ or $\cos^{-1}\left(\frac{12}{\sqrt{208}}\right)$	33.7	3	M1 M1 A1	A correct trig ratio for angle x A complete method to find angle x Accept answers rounding to 33.7
						Total 3 marks