Q1. Here is a right-angled triangle.

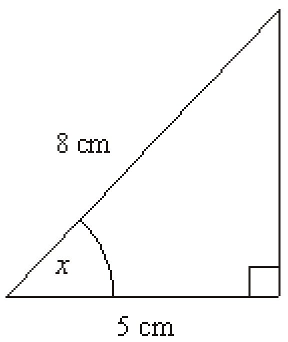


Diagram **NOT** accurately drawn

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

x = ...°

(Total 3 marks)

Q3.

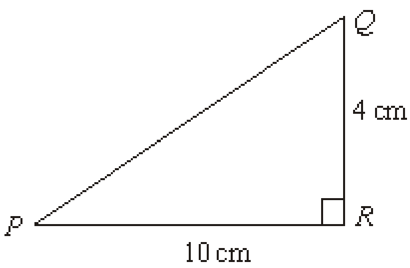


Diagram **NOT** accurately drawn

PQR is a right-angled triangle.

QR = 4 cm
PR = 10 cm

Work out the size of angle RPQ.
Give your answer correct to 3 significant figures.

....°

(Total 3 marks)

Q4. Here is a right-angled triangle.

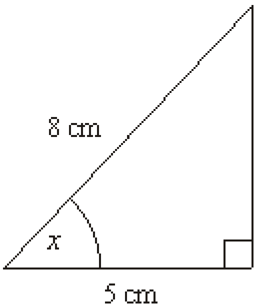


Diagram **NOT** accurately drawn

(a) Calculate the size of the angle marked x.
Give your answer correct to 1 decimal place.

x = ...°

(3)

Here is another right-angled triangle.

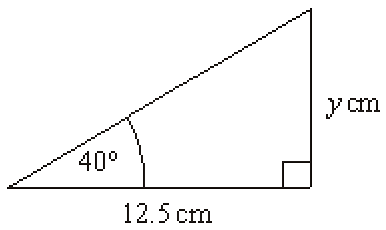


Diagram **NOT** accurately drawn

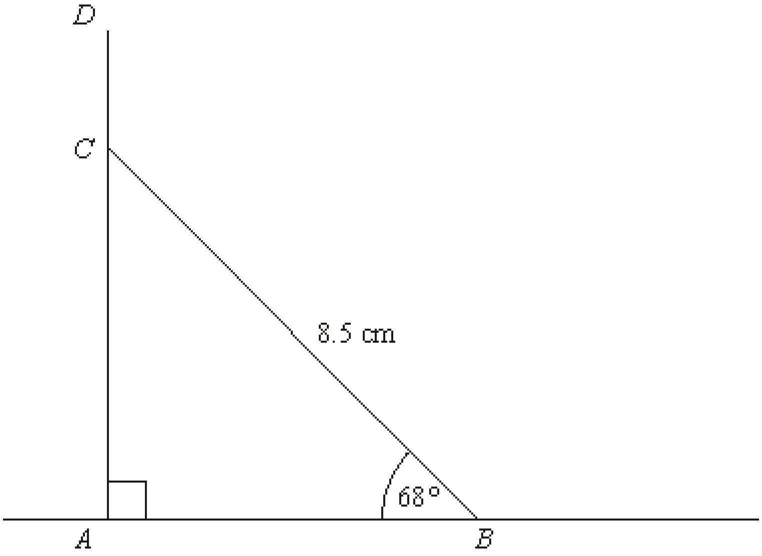
(b) Calculate the value of y.
Give your answer correct to 1 decimal place.

y = ...

(3)
(Total 6 marks)

Q5.

Diagram **NOT** accurately drawn


D
C
8.5 cm
68°
A
B

The diagram represents a vertical pole ACD.
AB is horizontal ground.
BC is a wire of length 8.5 metres.

The height of the pole AD is 9 metres.

For the pole to be correctly installed, the length DC has to be at least 1 metre.

Show that the pole has been correctly installed.

....

(Total 4 marks)

M1.

Working	Answer	Mark	Additional Guidance
cos x = $\frac{5}{8}$	51.3 – 51.35	3	**M1** for cos(x =) $\frac{5}{8}$ **M1** for $\cos^{-1}\frac{5}{8}$ or $\cos^{-1}$ 0.625, or $\cos^{-1}(5 \div 8)$ **A1** for 51.3 – 51.35 (SC **B2** for 0.89 – 0.9 or 57 – 57.1 seen) **Alternative Scheme** $h^2 = 8^2 - 5^2$ (= 39) **M1** for sin(x =) $\frac{\sqrt{"39"}}{8}$ or tan (x =) $\frac{\sqrt{"39"}}{5}$ or $\frac{\sin x}{\sqrt{"39"}} = \frac{\sin 90}{8}$ oe or $(\sqrt{"39"})^2 = 8^2 + 5^2 - 2 \times 8 \times 5 \times \cos x$ **M1** for $\sin^{-1}(\frac{\sqrt{"39"}}{8})$ or $\sin^{-1}(\frac{\sqrt{"39"} \times \sin 90}{8})$ or $\tan^{-1}(\frac{\sqrt{"39"}}{5})$ or $\cos^{-1}(\frac{8^2 + 5^2 - (\sqrt{"39"})^2}{2 \times 8 \times 5})$ **A1** for 51.3 – 51.35
			Total for Question: 3 marks

M3.

Working	Answer	Mark	Additional Guidance

$\tan QPR = \frac{4}{10}$ $QPR = \tan^{-1}\left(\frac{4}{10}\right) = 21.8°$ **or** $QP = \sqrt{4^2 + 10^2}$ $\sin QPR = \frac{4}{\sqrt{4^2 + 10^2}}$ $QPR = \sin^{-1}\left(\frac{4}{\sqrt{4^2 + 10^2}}\right)$	21.8	3	**M1** $\tan QPR = \frac{4}{10}$ **M1** $\tan^{-1}\frac{4}{10}$ **or** $\tan^{-1}0.4$ **A1** 21.8° – 21.81° inclusive **OR** [$QP = \sqrt{4^2 + 10^2}$ (=10.77…)] **M1** $\sin(QPR =)\frac{4}{\sqrt{4^2 + 10^2}}$ **or** $\cos(QPR =)\frac{10}{\sqrt{4^2 + 10^2}}$ **M1** $\sin^{-1}\frac{4}{\sqrt{4^2 + 10^2}}$ **or** $\cos^{-1}\frac{10}{\sqrt{4^2 + 10^2}}$ **A1** 21.8° – 21.81° inclusive SC: **B2** for 24.2(237…..) or 0.380(5….)
			Total for Question: 3 marks

M4.

	Working	Answer	Mark	Additional Guidance
(a)	$\cos x = \frac{5}{8}$	51.3 – 51.35	3	**M1** for $\cos(x =)\frac{5}{8}$ **M1** for $\cos^{-1}\frac{5}{8}$ or $\cos^{-1} 0.625$, or $\cos^{-1}(5 \div 8)$ **A1** for 51.3 – 51.35 (SC **B2** for 0.89 – 0.9 or 57 – 57.1 seen) **Alternative Scheme** $h^2 = 8^2 - 5^2$ (= 39) **M1** for $\sin(x =)\frac{\sqrt{"39"}}{8}$ or $\tan(x =)\frac{\sqrt{"39"}}{5}$ or

	Working	Answer	Mark	Additional Guidance
				$\frac{\sin x}{\sqrt{"39"}} = \frac{\sin 90}{8}$ oe or $(\sqrt{"39"})^2 = 8^2 + 5^2 - 2 \times 8 \times 5 \times \cos x$ **M1** for $\sin^{-1}(\frac{\sqrt{"39"}}{8})$ or $\sin^{-1}(\frac{\sqrt{"39"} \times \sin 90}{8})$ or $\tan^{-1}(\frac{\sqrt{"39"}}{5})$ or $\cos^{-1}(\frac{8^2 + 5^2 - (\sqrt{"39"})^2}{2 \times 8 \times 5})$ **A1** for 51.3 – 51.35
(b)	$\tan 40 = \frac{y}{12.5}$ $y = 12.5 \times \tan 40$	10.4 – 10.5	3	**M1** for $\tan 40 = \frac{y}{12.5}$ **M1** for 12.5 × tan 40 **A1** for 10.4 – 10.5 SC: **B2** for ±(13.9 – 14.0) or 9 – 9.1 seen **Alternative scheme** **M1** for $\frac{y}{\sin 40} = \frac{12.5}{\sin 50}$ oe **M1** for $y = \frac{12.5}{\sin 50} \times \sin 40$ **A1** for 10.4 – 10.5 SC: **B2** for ±(35.4 – 35.5) or 10.39 – 10.396 seen
				Total for Question: 6 marks

M5.

	Working	Answer	Mark	Additional Guidance

QWC **i, iii** **FE**	$\sin 68° = \frac{AC}{8.5}$ AC = 8.5 × sin 68° = 7.881 7.881 + 1 < 9	Reason supported by calculation	4		

Total for Question: 4 marks

E1. This was a standard right-a angled trigonometry question involving cos. Not all candidates could access the question with a lot of confusion over rules and misuse of the correct function - for example, cos5 ÷ 8, which would have given an error on the calculator, or cos 0.625, which gives a plausible answer albeit close to 90°.

E3. Nearly 65% of candidates were unable to gain any marks. Some candidates found hypotenuse but got no further. Those who realised they should use TAN often could not use inv tan correctly and tan 0.4 was seen. There were a few cases of radians or grads being used. Just under 30% of candidates scored full marks.

E4. In part (a) many candidates struggled with this question or adopted a long-winded approach involving Pythagoras and the sine rule.

Common errors included failing to identify cos as the appropriate ratio or using an incorrect order of operations when finding invcos. The sine rule candidates often failed to rearrange correctly, some of them failed to put sine at all and others calculated the third side using Pythagoras incorrectly.

In part (b) most candidates recognised the need to use the tan ratio but faltered when it became necessary to manipulate the formula to make y the subject. A common error was to write tan40 = y/12.5 and then rearrange incorrectly confusing the angle and side length given to calculate 40 × tan12.5. Others attempted tan40 ÷ 12.5 or 12.5 ÷ tan 40. Some candidates identified the third angle as 50 and then successfully used the sine rule.