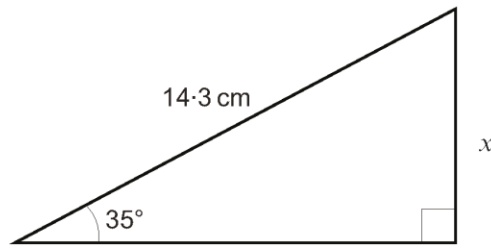


Trigonometreg Triangl Ongl Sgwâr

1.

(a)



Nid yw'r diagram wedi'i luniadu wrth raddfa

Cyfrifwch yr hyd x .

[3]

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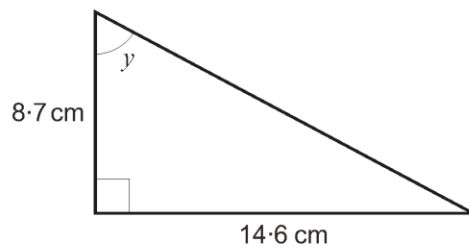
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(b)



Nid yw'r diagram wedi'i luniadu wrth raddfa

Cyfrifwch faint ongl y .

[3]

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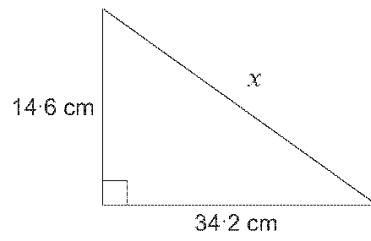
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2.

(a)



Nid yw'r diagram wedi'i luniadu wrth raddfa

Cyfrifwch yr hyd x .

[3]

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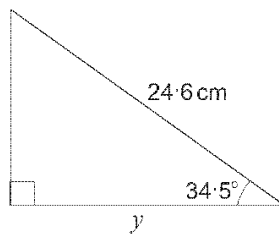
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(b)



Nid yw'r diagram wedi'i luniadu wrth raddfa

Cyfrifwch yr hyd y .

[3]

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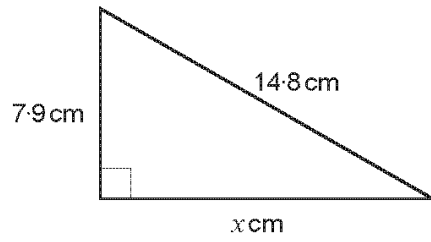
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3.

Cyfrifwch hydoedd yr ochrau x ac y yn y trioglau ongl-sgwâr sy'n cael eu dangos isod.

(a)

[3]



Nid yw'r diagram wedi'i luniadu wrth raddfa

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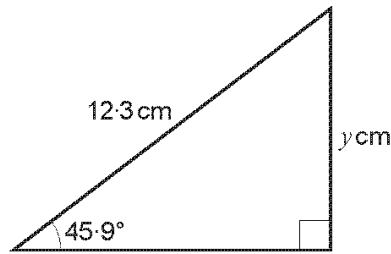
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$x = \dots\dots\dots \text{ cm}$

(b)

[3]



Nid yw'r diagram wedi'i luniadu wrth raddfa

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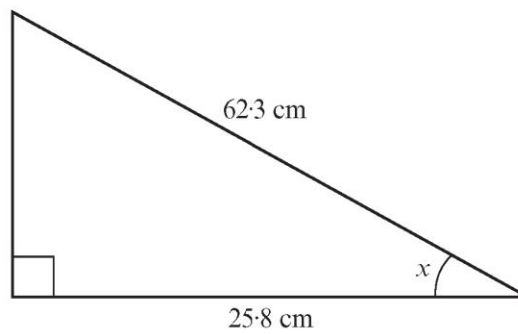
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$y = \dots\dots\dots \text{ cm}$

4.

(a) Cyfrifwch faint ongl x yn y diagram.



Nid yw'r diagram wedi'i luniadu wrth raddfa

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[3]

(b) Mae Sam yn gweithio ar gyfrifiad gwahanol ond mae hi wedi anghofio ei chyfrifiannell.

Mae hi newydd ysgrifennu " $\tan 34^\circ = \frac{z}{14.3}$ " yn ei llyfr.

Cwblhewch y cyfrifiad i ddarganfod gwerth z i Sam.

$$\tan 34^\circ = \frac{z}{14.3}$$

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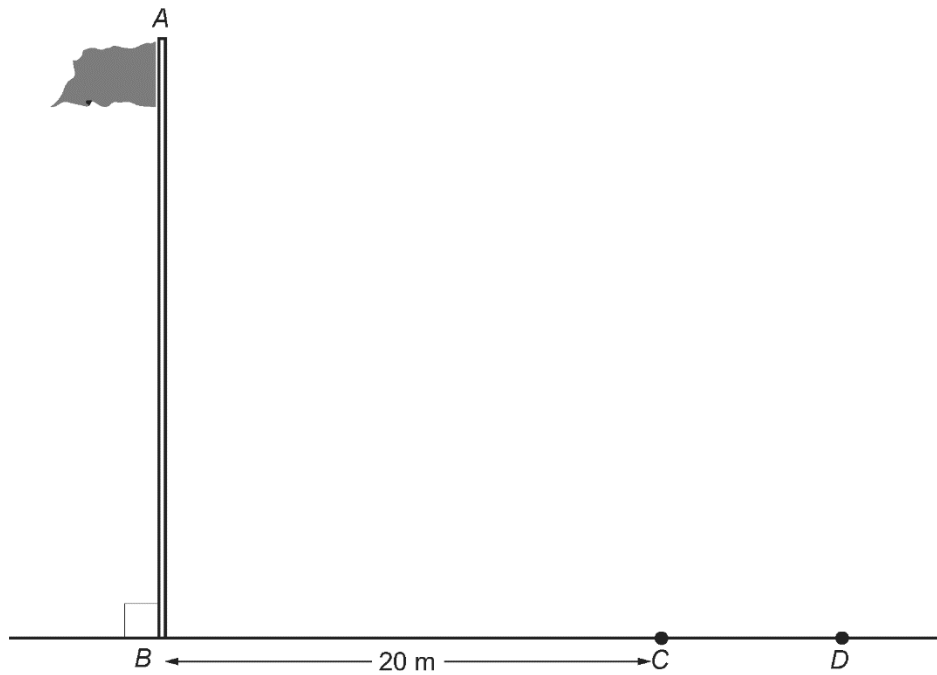
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[2]

6.

Uchder polyn fflag fertigol, AB , yw 40 m.
 Mae'r pwyntiau B , C a D ar dir gwastad, ac mae BCD yn llinell syth.
 Mae pwynt C 20 m o waelod y polyn fflag.
 Ongl godiad (*angle of elevation*) pen uchaf y polyn fflag o bwynt D yw 51° .



Nid yw'r diagram wedi'i luniadu wrth raddfa

Pa mor bell i ffwrdd o'i gilydd yw pwyntiau C a D ?

[4]

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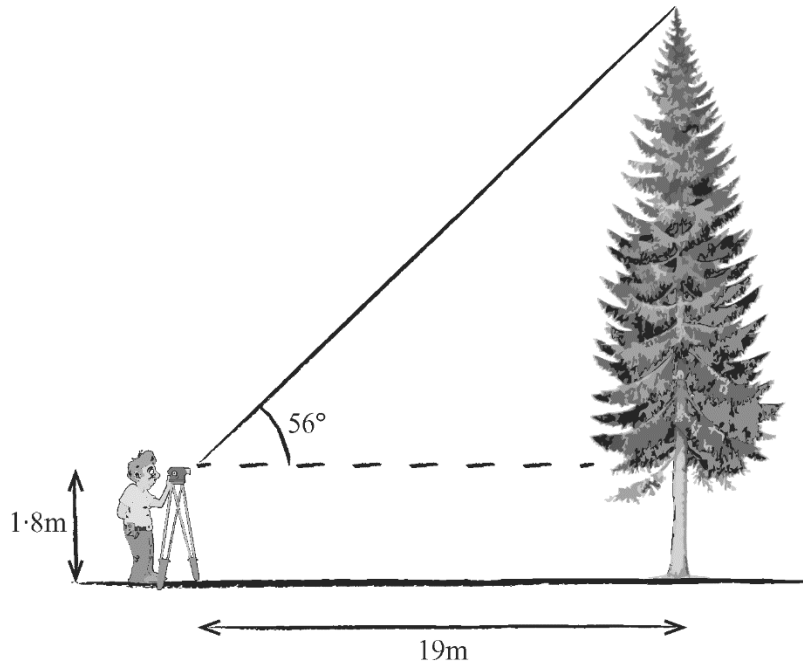
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8.

Mae arolygwr coed (*tree surveyor*) yn cyfrifo uchder coeden fertigol.
 Mae'r arolygwr yn gallu mesur ongl godiad (*angle of elevation*) pen ucha'r goeden o'i offeryn mesur, sydd 1.8m uwchlaw lefel y ddaear.
 Pan fo'r arolygwr yn sefyll 19m o waelod y goeden, yr ongl mae e'n ei mesur yw 56° .

Mae braslun o'r sefyllfa hon yn cael ei ddangos isod.



Nid yw'r diagram wedi'i luniadu wrth raddfa

Cyfrifwch uchder llawn y goeden.

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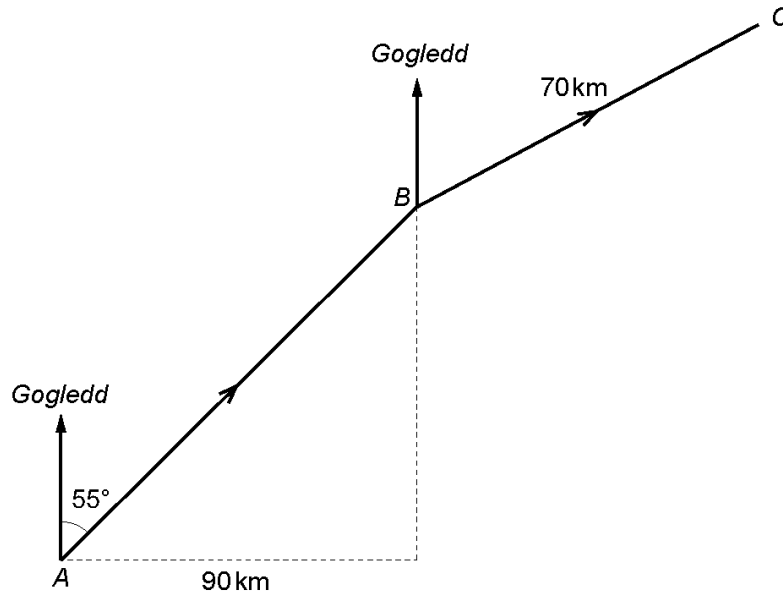
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[4]

9.

Mae llong yn hwylio o borthladd *A*, ar gyfeiriant o 055° , i borthladd *B*, sy'n 90 km i'r dwyrain o *A*. Yna mae'n hwylio ar gyfeiriant o 067° am 70 km nes iddi gyrraedd porthladd *C*.



Nid yw'r diagram wedi'i luniadu wrth raddfa

Pa mor bell i'r dwyrain o borthladd *A* yw porthladd *C*?

[5]

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Cynllun Marcio

1.

(a) $x = 14.3 \times \sin 35^\circ$ $x = 8.2(02\dots\text{cm})$	M2 A1	M1 for $\sin 35^\circ = x/14.3$ Accept 8(cm) from correct working
(b) $\tan y = 14.6/8.7$ $y = \tan^{-1} 14.6/8.7$ or $\tan y = 1.678\dots$ $y = 59(.2^\circ)$	M1 A1 A1 6	Allow for sight of $\tan y = 1.67$ or 1.68

2.

Methods in Mathematics June 2015 Unit 2 Higher Tier	Mark	Comment
7.(a) $(x^2 =) 34.2^2 + 14.6^2$ $x^2 = 1382.8$ OR $x = \sqrt{1382.8}$ $(x =) 37.186\dots$ (cm)	M1 A1 A1	Accept rounded or truncated
(b) $y = 24.6 \times \cos 34.5^\circ$ $(y =) 20.27\dots$ (cm)	M2 A1	M1 for $\cos 34.5^\circ = y/24.6$ Accept rounded or truncated
(c) $z = 14.7/\sin 24.7^\circ$ $(z =) 35.17865\dots$ (cm)	M2 A1 9	M1 for $\sin 24.7^\circ = 14.7/z$ Accept rounded or truncated

3.

Linear GCSE Mathematics Higher Tier November 2015 Paper 2	Mark	FINAL MARK SCHEME Comments
9.(a) $14.8^2 = 7.9^2 + x^2$ or $(x^2 =) 14.8^2 - 7.9^2$ $x^2 = 156.63$ or $(x =) \sqrt{156.63}$ $(x =) 12.5(15\dots\text{cm})$	M1 A1 A1	ISW. Allow 13(cm) following correct working
(b) $y = 12.3 \times \sin 45.9^\circ$ $(y =) 8.8(3295\dots\text{cm})$	M2 A1 6	M1 for $\sin 45.9^\circ = y/12.3$

4.

9.(a) $\cos x = 25.8/62.3$ $65.5(3576\dots^\circ)$ rounded or truncated	M1 A2	A1 for $\cos^{-1} 0.4(141\dots)$ 65.8 comes from premature rounding, award M1 and A1 implied
(b) $z = 14.3 \times \tan 34$ $9.6(454\dots)$ or 9.65	M1 A1 5	If $9.6\dots$ seen in working, award M1 A1, however if not seen and incorrectly rounded then M1, A0. An answer of 9.64 or 9.8 from correct working is M1, A0 An unsupported answer of 9 gets M0, A0.

5.

Sketch of a right angled triangle showing angle of elevation 18° and hypotenuse 3.2km (or 3200 m) Height climbed = $3.2 \times \sin 18^\circ$ or $3200 \times \sin 18^\circ$ $0.988(854\dots\text{ km})$ or $988(.854\dots\text{m})$ or 989 (m) 1339 (metres above sea level to the nearest metre)	S1	Implied by M2 or M1
	M2	M1 for $\sin 18^\circ = \text{height climbed}/ 3.2$ or $\sin 18^\circ = \text{height climbed}/ 3200$
	A1	Accept rounded or truncated.
	B1	FT provided M1 previously awarded and rounding is correct
	5	

6.

$(BD =) 40 \div \tan 51^\circ$ $(BD =) 32(\cdot 391 \dots)$ (m) $(CD =) = 12(\cdot 391 \dots)$ (m)	✓	M2	M1 for $\tan 51^\circ = 40 \div BD$.
	✓	A1	
	✓	A1	FT 'their $32(\cdot 391 \dots)$ ' – 20 provided at least M1 awarded and their $32(\cdot 391 \dots) > 20$. If no marks awarded, SC2 for (incorrect placement of the 51° in the diagram leading to) a correct evaluation of $\tan 51^\circ \times 40 - 20$ ($29(\cdot 395 \dots)$) SC1 for (incorrect placement of the 51° in the diagram leading to) $\tan 51^\circ \times 40$

7.

10. Strategy, using Pythagoras' Theorem then trigonometry $8.2^2 = 6.3^2 + AC^2$ $AC = \sqrt{(8.2^2 - 6.3^2)} (= \sqrt{27.55})$ $AC = 5.248 \dots$ $\tan D = AC / 10.6$ Answers in the range $26.1 \dots (^\circ)$ to $26.35 (^\circ)$	S1	Needs to involve working towards use of triangle ADC
	M1	
	A1	
	A1	
	M1	FT candidates AC
	A1	Allow rounded or truncated answers in working throughout, but the final answer must be in the given range to award the final A1 <i>Alternative:</i> S1 Complete strategy M1 method for both of the first 2 stages A1 for first stage answer A1 for second stage answer M1 method for the third stage A1 Answers in the range $26.1 \dots (^\circ)$ to $26.35 (^\circ)$ For example: S1 Strategy, using trigonometry – cos ratio, cosine rule and sine rule M1 $\cos B = 6.3/8.2$ AND $AD^2 = 8.2^2 + 16.9^2 - 2 \times 8.2 \times 16.9 \times \cos B$ A1 Angle B = $39.799 \dots$ rounded or truncated A1 $AD = 11.828 \dots$ rounded or truncated M1 $\sin D/8.2 = \sin B/11.8$ FT candidates angle B A1 Answers in the range $26.1 \dots (^\circ)$ to $26.35 (^\circ)$

8.

11. Opposite = $\tan 56^\circ \times 19$ $= 28.168658 \dots$ (m) Height of the tree = $29.968658 \dots$ (m)	M2	M1 for $\tan 56^\circ = \text{opposite}/19$
	A1	Accept rounded or truncated from working
	A1	Accept rounded or truncated from working, and
	4	FT from their rounded or truncated 28.168...

9.

Unitised Unit 3 – Nov 2015 Higher Tier		FINAL MARK SCHEME Comments
12. A correct positioning of 67° or 23° . $70 \times \sin 67^\circ$ OR $70 \times \cos 23^\circ$ $= 64(\cdot 435 \dots)$ (km) (How far east \Rightarrow) $154(\cdot 435 \dots)$ (km)	B1 M2 A1 A1 5	M1 for $\sin 67^\circ = x/70$ OR $\cos 23^\circ = x/70$ FT their $64(\cdot 435 \dots)$ provided M1 awarded.

10.

<p>11. Strategy: relevant sketch showing understanding of centre of the road and vertical buildings and angle(s) of elevation shown in the correct positions</p> <p>$(x =) \tan 72 \times 10$ OR $(y =) \tan 38 \times 10$</p> <p>$(x =) 30.7768\dots$ AND $(y =) 7.812856\dots$ Answers in the range 22.9(m) to 23(m)</p>	<p>S1</p> <p>M2</p> <p>A1</p> <p>A1</p>	<p>Ignore placement of 20m in the sketch This S1 may be implied by relevant working</p> <p>M1 for $\tan 72 = x/10$ or $\tan 38 = y/10$, OR M1 for $x = \tan 72 \times 20$ or $y = \tan 38 \times 20$</p> <p>FT use of 20, answers 61.55... AND 15.6257...</p> <p>FT use of 20, answer of 46(m) or 45.9(3m)</p> <p>Accept sine rule as an equivalent method.</p> <p><i>Incorrect placement of the angles leads to:</i> <u>Either</u> <i>S0 sketch appropriate but angles at top vertices</i> <i>M1 for $x = 10/\tan 72$ OR $y = 10/\tan 38$</i> <i>A1 for $x = 3.249\dots$ AND $y = 12.799\dots$</i> <i>A1 for 9.55... (m) rounded or truncated</i> <u>Or</u> <i>20 used, not 10, then SC2 for an answer of 19.1... (m), or SC1 for 6.498... or 25.598...</i></p> <p>Do not accepted unsupported answers, as scale drawing are not accepted, max S1 for meeting the criteria for the sketch</p>
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