This is a calculator test (50 minutes).

The following marks are awarded for each question.

B	Unconditional accuracy mark.
M	Method mark – the correct method must be shown but there may be an arithmetic error; the sight of the value given in brackets implies the award of the method mark.
A	Accuracy mark – unless the question specifies that working **must** be shown then the sight of the correct answer implies the award of full marks (unless the answer clearly comes from incorrect working).
C	Communication mark.
P	Process mark to show correct process for problem solving. Any other process of a similar standard to achieve an accurate result is acceptable to achieve this mark.
FT	Incorrect values may be **followed through** from one step to the next **provided** that the correct method is seen in each step and the only errors are arithmetic. This is shown in mark schemes by putting a number in inverted commas.
OE	Or equivalent answer mark.

Q	Answer	Mark	Comment
1a	54.8	M1	for sin x = 5.35 ÷ 6.55 OE (allow 1 error)
		A1	accept 54.7 to 54.8
1b	52.1	M1	for sin x = 5.25 ÷ 6.65 OE (allow 1 error)
		A1	accept 52.1 to 52.2
1c	50	B1	

3a	75.5 (cm^2)	P1	for $\frac{(15\times12\times\sin123)}{2}$ OE
		A1	accept 75.4 to 75.5
3b	23.8 (cm)	P1	for (AC^2 =) $15^2 + 12^2 - 2(15)(12)\cos 123$ OE (= 565.07 ...)
		A1	accept 23.7 to 23.8
5a	30	B1	
5b	1	B1	
7	60°	B1	accept 60
	120°	B1	accept 120
9a	7.42	P1	for 9.35 × cos 37.5 (allow 1 error)
		A1	accept 7.41 to 7.42
9b	7.24	P1	for 9.25 × cos 38.5 (allow 1 error)
		A1	accept 7.23 to 7.24
9c	7	B1	

11	1.36 cm^2	P1	for (area of triangle =) $7\times7\times\frac{\sin40}{2}$ OE (= 15.748...)
		P1	for (area of sector =) $\frac{40}{360}\times\pi\times7^2$ OE (= 17.104)
		P1	for "17.104" − "15.748"
		A1	accept 1.35 to 1.36
		B1	for cm^2
13	13.2 (cm)	P1	for (AC^2=) $7.8^2 + 9.6^2 - 2(7.8)(9.6)\cos 73$ OE (109.214...)
		P1	for $\sqrt{"10.9,214"}$ (= 10.45)

13		P1	for $\frac{BC}{\sin 58} = \frac{"10.45"}{\sin 42}$
		P1	for $(BC =) \frac{"10.45"}{\sin 42} \times \sin 58$
		A1	accept 13.2 to 13.3

15	60°	B1	accept 60
	300°	B1	FT 360 − "60"

Question	Topic	Step	Marks
1a	Find upper and lower bounds of calculations that involve division, Solve problems involving the application of both Pythagoras' theorem and trigonometry in right-angled triangles	10th	2
1b	Find upper and lower bounds of calculations that involve division, Solve problems involving the application of both Pythagoras' theorem and trigonometry in right-angled triangles	10th	2
1c	Find upper and lower bounds of calculations that involve division,	10th	1
3a	Know and apply $\text{Area} = \frac{1}{2}ab\sin C$ to calculate the sides or angles of any triangle	11th	2
3b	Know and apply the cosine rule $a^2 = b^2 + c^2 - 2bc\cos A$ to find unknown lengths	10th	2
5a	Know the exact values of $\sin\theta$ and $\cos\theta$ for θ = 0°, 30°, 45°, 60° and 90°; Know the exact value of $\tan\theta$ for θ = 0°, 30°, 45° and 60°	8th	1
5b	Know the exact values of $\sin\theta$ and $\cos\theta$ for θ = 0°, 30°, 45°, 60° and 90°; Know the exact value of $\tan\theta$ for θ = 0°, 30°, 45° and 60°	8th	1
7	Know the exact values of $\sin\theta$ and $\cos\theta$ for θ = 0°, 30°, 45°, 60° and 90°; Know the exact value of $\tan\theta$ for θ = 0°, 30°, 45° and 60°	8th	2
9a	Find upper and lower bounds of calculations that involve division, Solve problems involving the application of both Pythagoras' theorem and trigonometry in right-angled triangles	10th	2
9b	Find upper and lower bounds of calculations that involve division, Solve problems involving the application of both Pythagoras' theorem and trigonometry in right-angled triangles	10th	2
9c	Find upper and lower bounds of calculations that involve division, Solve problems involving the application of both Pythagoras' theorem and trigonometry in right-angled triangles	10th	1
11	Use the formulae for length of an arc and area of a sector of a circle to solve problems; Know and apply $\text{Area} = \frac{1}{2}ab\sin C$ to calculate the sides or angles of any triangle	11th	5
13	Use the sine and cosine rules to solve 2D and 3D problems	12th	5
15	Know the exact values of $\sin\theta$ and $\cos\theta$ for θ = 0°, 30°, 45°, 60° and 90°; know the exact value of $\tan\theta$ for θ = 0°, 30°, 45° and 60°	8th	2