QUESTION 1 Cross only the correct letter.

| | | | | | |
|---|---|---|---|---|---|
| 1.1 | ~~A~~ | B | C | D | ✓ |
| 1.2 | A | B | ~~C~~ | D | ✓ |
| 1.3 | A | B | C | ~~D~~ | ✓ |
| 1.4 | ~~A~~ | B | C | D | ✓ |
| 1.5 | A | ~~B~~ | C | D | ✓ |

[5]

QUESTION 2

2.1.1 (3)

| INITERVAL OF TEST MARKS | MIDPOINT ✓column | NUMBER OF LEARNERS | MIDPOINT × FREQUENCY ✓column |
|---|---|---|---|
| $0 \le x < 20$ | **10** | 4 | **40** |
| $20 \le x < 40$ | **30** | 5 | **150** |
| $40 \le x < 60$ | **50** | 9 | **450** |
| $60 \le x < 80$ | **70** | 13 | **910** |
| $80 \le x < 100$ | **90** | 10 | **900** |
| Totals | | 41 | **2450** ✓total |

2.1.2 $60 \le x < 80$ ✓ Ans (1)

2.1.3 $\frac{2450}{41} \overset{\checkmark}{=} 59,76$ ✓ Fraction Ans (2)

2.2.1 6 10 12 15 16 19 21 21 22 23 29 54 64 ✓ Order

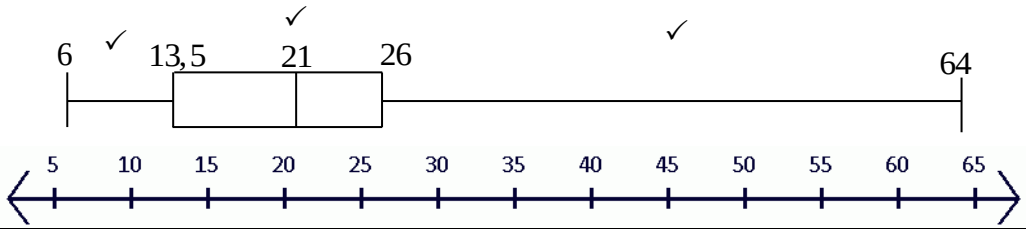
Min=6 Max=64 ✓ Min &Max

$Q_1 = \frac{13+15}{2} = 13,5$ ✓ $Q_1$

$Q_2 = 21$ ✓ $Q_2$

$Q_3 = \frac{23+29}{2} = 26$ ✓ $Q_3$ (5)

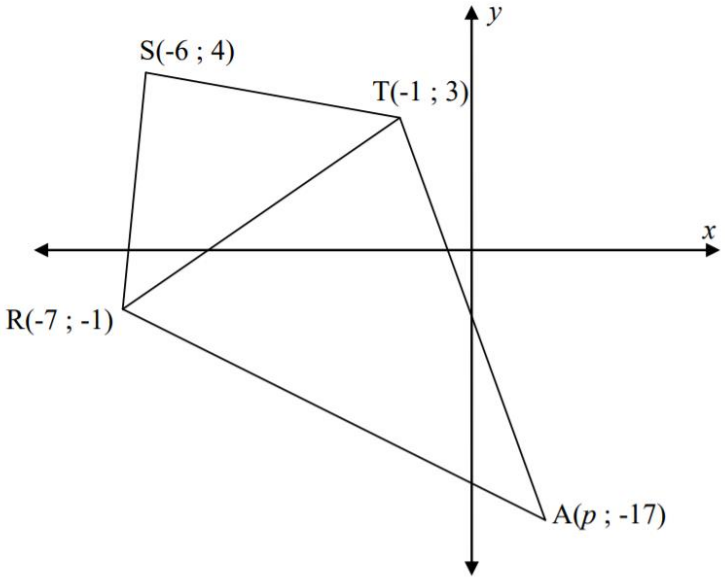
2.2.2




Box
Top 25%
Bottom 25%
(3)

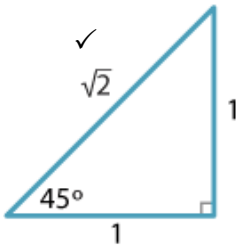
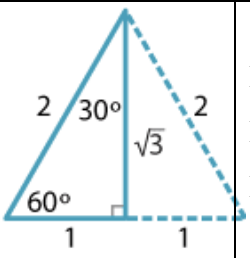
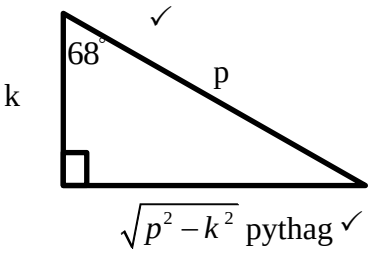
2.2.3 $26 - 13,5 = 12,5$ ✓ ✓ Diff (CA) Ans(2)

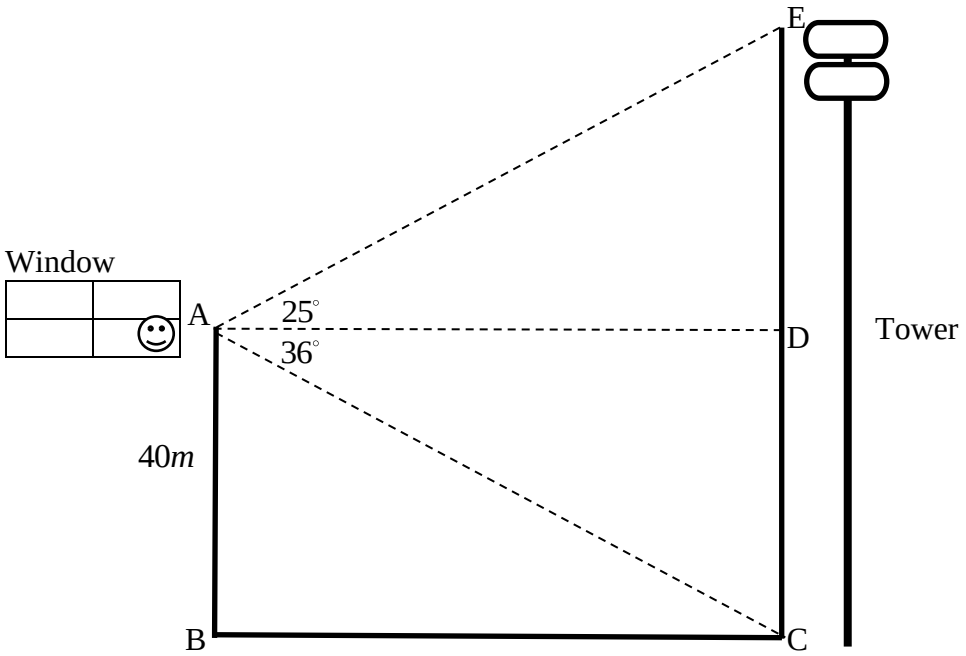
**[16]**

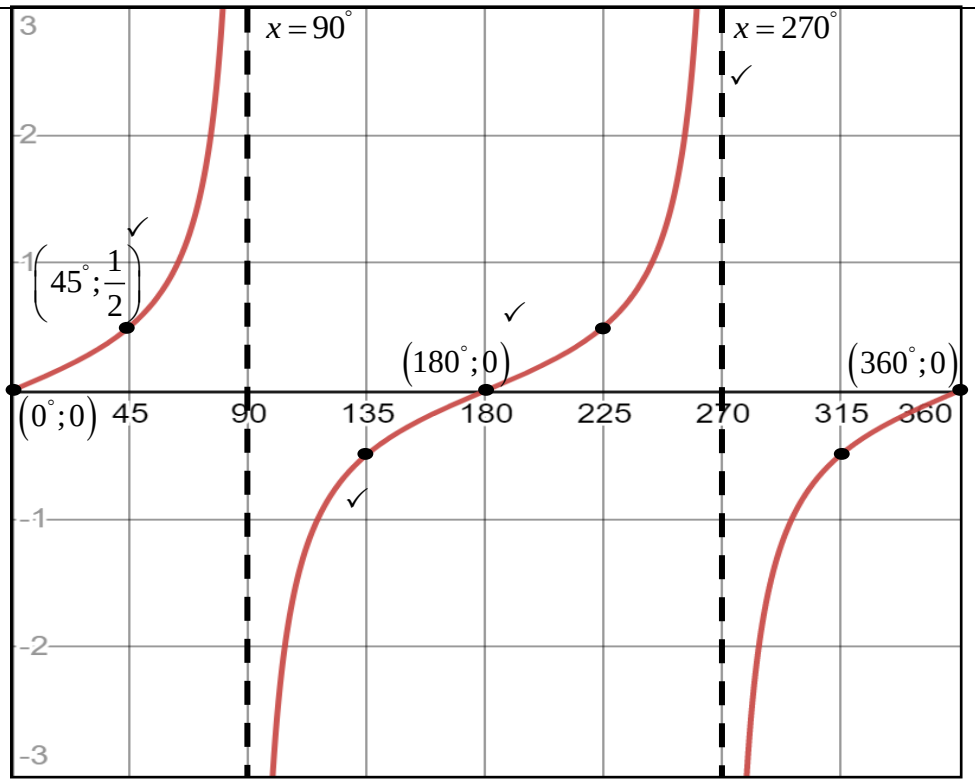
| QUESTION 3 | | |
|---|---|---|
| |  | |
| 3.1. | $SR = \sqrt{(-6+7)^2+(4+1)^2}$ ✓<br>$SR = \sqrt{26}$ ✓<br><br>$ST = \sqrt{(-6+1)^2+(4-3)^2}$<br>$ST = \sqrt{26}$ ✓<br>$SR=ST, \therefore \Delta RST$ is isosceles ✓ | Subs SR<br><br><br>ST<br><br>Reason<br>(4) |
| 3.2. | $B = \left(\frac{-7+(-1)}{2};\frac{-1+3}{2}\right)$<br>$B=(-4;1)$ ✓✓ | $x$-value<br>$y$-value<br>(2) |

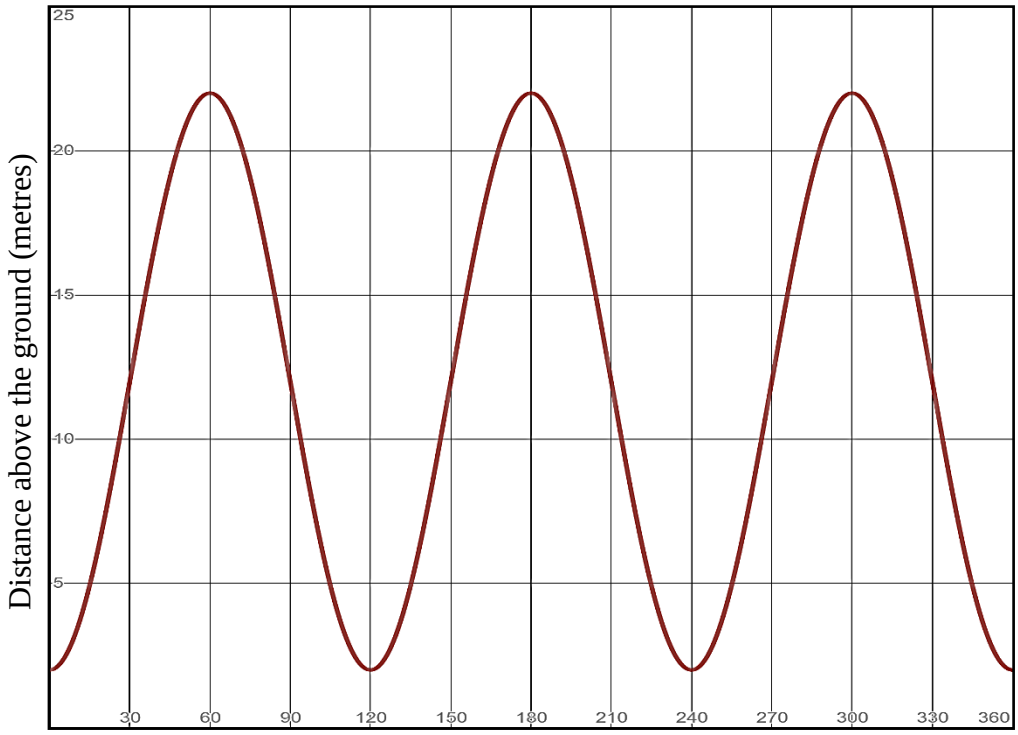
| | | |
|---|---|---|
| 3.3. | $m_{SA} = \frac{1-4}{-4+6} = -\frac{3}{2}$ ✓<br>$\therefore y = -\frac{3}{2}x + c$<br>$1 = -\frac{3}{2}(-4) + c$ ✓<br>$c = -5$<br>$\therefore y = -\frac{3}{2}x - 5$ ✓ | Gradient<br>Sub<br><br><br><br><br>Ans<br>(3) |
| 3.4 | $-17 = -\frac{3}{2}p - 5$ ✓<br>$-12 = -\frac{3}{2}p$ ✓<br>$p = 8$ ✓ | Subs<br>Simplify<br>Ans<br>(3) |
| 3.5 | $m_{RT} = \frac{3+1}{-1+7} = \frac{2}{3}$ ✓<br>$m_{RT} \times m_{SA} = -1$<br>$\frac{2}{3} \times -\frac{3}{2} = -1$ ✓<br>$\therefore RT \perp SA$ | Gradient<br><br><br>Reason<br>(2) |
| 3.6 | $(-2;-2)$ ✓✓ | $x$-value<br>$y$-value<br>(2) |

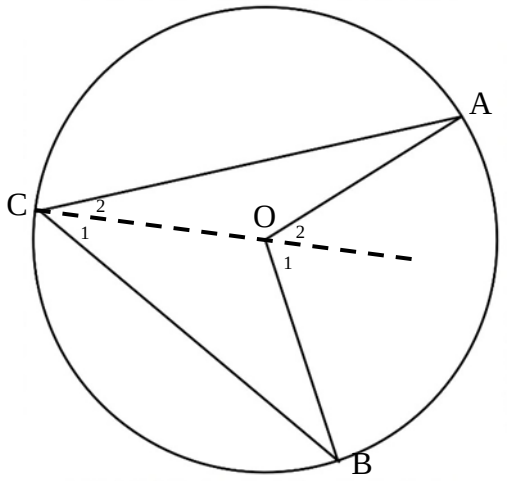
**[16]**

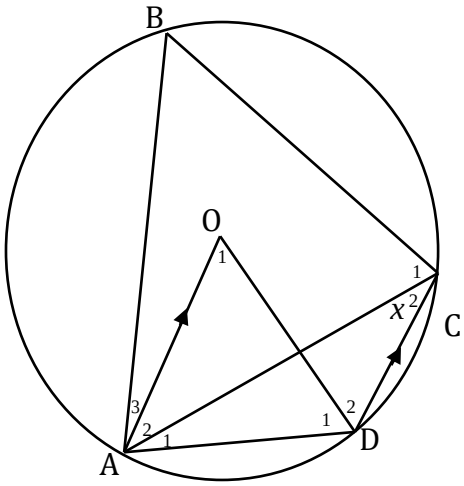
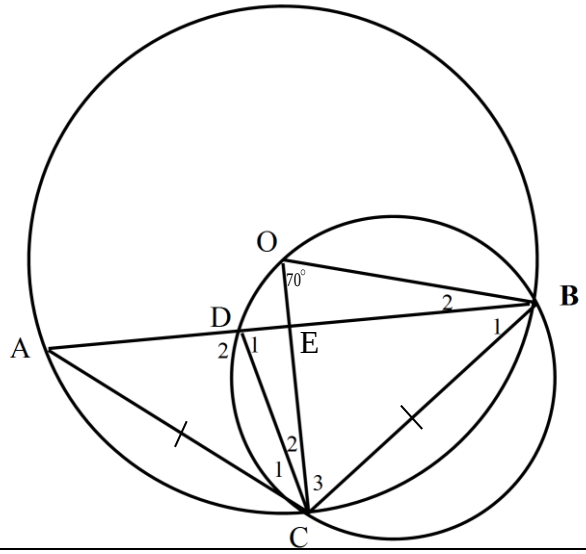
| QUESTION 4 | | |
|---|---|---|
| 4.1.1 | $6\sin x = 1$<br>$\sin x = \frac{1}{6}$ ✓<br>$x = 9,59^\circ$ ✓ | Simplify<br>Ans<br>(2) |
| 4.1.2 | $4\sec x - 3 = 5$<br>$\frac{1}{\cos x} = 2$ ✓<br>$\cos x = \frac{1}{2}$ ✓<br>$x = 60^\circ$ ✓ | $\frac{1}{\cos x}$<br>Simplify<br>Ans<br>(3) |
| 4.2.1 | $\frac{\sin 30^\circ \cdot \cos 45^\circ}{\tan 60^\circ}$<br>$\frac{1}{2} \cdot \frac{1}{\sqrt{2}}$ ✓<br>$\frac{\sqrt{3}}{1}$ ✓<br>$\frac{1}{2\sqrt{2}} \times \frac{1}{\sqrt{3}}$ ✓<br>$\frac{1}{2\sqrt{6}} = \frac{1}{\sqrt{12}}$ ✓<br><br><br><br> | Diagram<br>Num<br>Denom<br>Simplify<br>Ans<br>(5) |
| 4.2.2 | $\tan^2 30^\circ - \cos^2 30^\circ$<br>$\left(\frac{1}{\sqrt{3}}\right)^2 - \left(\frac{\sqrt{3}}{2}\right)^2$ ✓<br>$\frac{1}{3} - \frac{3}{4}$ ✓<br>$\frac{4-9}{12}$<br>$-\frac{5}{12}$ ✓ | $\left(\frac{1}{\sqrt{3}}\right)^2 - \left(\frac{\sqrt{3}}{2}\right)^2$<br>simplify<br>Ans<br>(3) |
| 4.3 | $\tan 68^\circ = \frac{\sqrt{p^2 - k^2}}{k}$ ✓<br><br> | Diagram<br>Pythag<br>Ans<br>(3) |

| | | |
|---|---|---|
| 4.4 |  | |
| 4.4.1 | $\tan 36^\circ = \frac{40}{AD}$ ✓<br>$AD = \frac{40}{\tan 36^\circ}$ ✓<br>$AD = 55,06$ ✓<br>**OR**<br>$D\hat{C}A = 54^\circ$ ∠'s in Δ ✓<br>$\tan 54^\circ = \frac{AD}{40}$ ✓<br>$AD = 40\tan 54^\circ$<br>$AD = 55,06$ ✓ | Equation<br>Simplify<br>Ans<br>(3)<br>**OR** |
| 4.4.2 | $\tan 25^\circ = \frac{ED}{55,06}$ ✓<br>$ED = 55,06\tan 25^\circ$<br>$ED = 25,67$ ✓<br>$CE = 55,06 + 25,67 = 80,73$ ✓ | Equation<br>ED<br>Ans<br>(3) |
| | | **[22]** |

| | | |
|---|---|---|
| QUESTION 5 | | |
| 5.1.1 |  | $x$-ints<br>Point $\left(45^\circ;\frac{1}{2}\right)$<br>Asymptotes<br>shape<br><br>-1 of no labels<br><br>(4) |
| 5.1.2 | $180^\circ$ ✓ | (1) |
| 5.1.3 | $y=-\left(\frac{1}{2}\tan x-1\right)$<br>$y=-\frac{\checkmark 1}{2}\tan x+\overset{\checkmark}{1}$ | Negative<br>+1<br>(2) |

| | | |
|---|---|---|
| 5.4 |  | |
| 5.4.1 | Maximum: $h(60)=10\sin(3(60-30))+12=22$ ✓<br>✓<br><br>Minimum: $h(0)=10\sin(3(0-30))+12=2$ ✓<br><br>**NOTE: learner can use 60, 180 or 300 for max and 0, 120, 240 or 360 for min** | Subs<br>Max<br>Min<br><br>(3) |
| 5.4.2 | $22-2=20$ ✓ | Ans<br>(1) |
| 5.4.3 | 120 seconds or 2 minutes ✓ | (1) |
| | | **[12]** |

| | | |
|---|---|---|
| QUESTION 6 | | |
| 6.1.1 | $MN = 2(2y+2)$ midpt theorem ✓<br>$MN = 4y+4$ ✓ | Ans<br>Reason<br>(2) |
| 6.1.2 | $18 = 4y+4$ ✓<br>$y = \frac{7}{2}$ ✓ | Sub<br>Ans<br>(2) |
| 6.2 | $\frac{CG}{GF} = \frac{33}{22} = \frac{3}{2}$ ✓ prop theorem; GD \|\| FE or line \|\| one side of $\Delta$ ✓<br>$\frac{BC}{BA} = \frac{3}{2} = \frac{15}{x}$ prop theorem; BG \|\| AF or line \|\| one side of $\Delta$ ✓<br>$x = 10$ ✓ | S<br>R<br>$S+R$<br>Ans<br>(4) |
| | | **[8]** |
| QUESTION 7 | | |
| 7.1. |  | ‘ |
| | construction: Radius OC extended<br>Let $\hat{C}_1 = x$<br>$\hat{B} = x$ $\angle$ opp = radii/side ✓<br>$\hat{O}_1 = 2x$ ext $\angle$ of $\Delta$ ✓<br><br>Let $\hat{C}_2 = y$<br>$\hat{A} = y$ $\angle$ opp = radii/side ✓<br>$\hat{O}_2 = 2y$ ext $\angle$ of $\Delta$<br>$A\hat{O}B$ (obtuse) $= 2x+2y$ ✓<br>$A\hat{O}B$ (obtuse) $= 2(x+y)$ ✓<br>$A\hat{O}B$ (obtuse) $= 2\hat{C}$ | (5) |

| | | | |
|---|---|---|---|
| 7.2 |  | | |
| | Statement | Reason | |
| | $\hat{A}_2 = x$ | **7.2.1** Alt ∠'s =; AD \|\| DC ✓ | (1) |
| | **7.2.2** $\hat{O}_1 = 2x$ ✓ | ∠ at centre 2× ∠ at circumference | (1) |
| | $\hat{D}_1 = 90^\circ - x$ | **7.2.3** ∠ opp = radii/side ✓ | (1) |
| | $\hat{A}_1 =$ **7.2.4** $90^\circ - x - x = 90^\circ - 2x$ ✓ | | (2)<br>**[10]** |
| Question 8 | | | |
| |  | | |
| 8.1.1 | $\hat{D}_1 = 70^\circ$ ✓ ∠'s in same seg ✓ | | (2) |
| 8.1.2 | $\hat{A} = 35^\circ$ ✓ ∠ at centre 2× ∠ at circumf ✓ | | (2) |
| 8.1.3 | $\hat{B}_1 = 70^\circ$ ✓ ∠ opp = side ✓ | | (2) |
| 8.2 | $\sin 70^\circ = \frac{EB}{5}$ ✓<br>$EB = 5\sin 70^\circ$ ✓<br>$EB = 4,7$ ✓<br>$AB = 2(4,7) = 9,4$ ✓ line from centre ⊥ to chord ✓ | | Equation<br>Simplify EB<br>Ans<br>Reason(5) |
| | | | **[11]** |