Decimal place deduction in question 3.2.1 only

1.1.1.

10 12 15 16 | 20 31 35 37 (40) 41 42 43 43 | 43 48 49 50

$\frac{575}{17} = 33,82$ ✓✓

✓numerator
✓answer (*Ignore d.p. 33,823529…)*

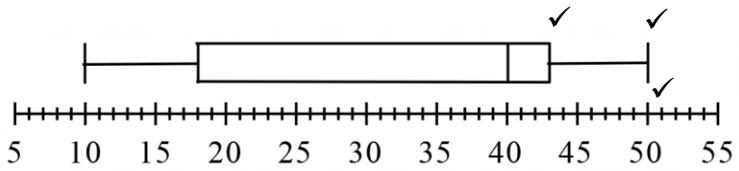
(2)

1.1.2.

Min = 5, Max = 50 ✓
LQ = 18 ✓
Median = 40 ✓
UQ = 43 ✓

✓answer
✓answer
✓answer
✓answer

1.1.3.



✓box
✓whiskers *(can have dots at ends)*
✓accuracy

(3)

1.1.4.

IQR = 43 – 18 = 25 ✓✓

✓43-18
✓answer (2)

1.1.5.

Negatively skewed ✓

✓answer (1)

1.2.1.

Class Interval ✓	Frequency	Class Mid-Point ✓	$f \times m$ ✓
$16 \leq x < 22$	10	**19**	**190**
$23 \leq x < 29$	15	**26**	**390**
$30 \leq x < 36$	40	**33**	**1320**
$37 \leq x < 43$	20	**40**	**800**
$44 \leq x < 50$	15	**47**	**705**
TOTAL:	**100**		**3405** ✓

estimated mean $= \frac{3405}{100} = 34,05$ ✓

✓column
✓column
✓total
✓answer

(4)

1.2.2.

$\frac{34,29 - 34,05}{34,29} \times \frac{100}{1} = 0,70\%$ ✓✓

✓fraction
✓answer [0,6999125…%]

(2)

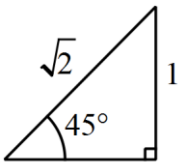
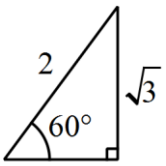
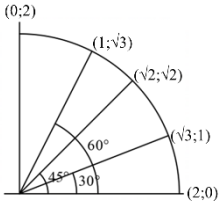
[18]

2.1.	$AC^2 = (10+2)^2 + (6+12)^2$ ✓ (*Pythagoras Thm*) $= 468$ ✓ $AC = 6\sqrt{13}$ ✓	✓S&R ✓answer ✓answer (3)
2.2.	$BC^2 = (6-18)^2 + (10-(-8))^2$ $= 468$ $BC = 6\sqrt{13}$ ✓ $\therefore AC = BC$ ✓ $\therefore \Delta ABC$ is isosceles	✓BC answer ✓conclusion (2)
2.3.	$m = \frac{-2+8}{-12-18} = -\frac{1}{5}$ ✓ ✓	✓fraction ✓answer (2)
2.4.	$m_{CD} = 5$ ✓ $\therefore y = 5x + c$ $\therefore 10 = 5(6) + c$ ✓ $\therefore c = -20$ $\therefore y = 5x - 20$ ✓	✓new gradient ✓substitution ✓answer (3)
2.5.	mid-point = $M(3;-5)$ ✓ $y = 5(3) - 20 = -5$ ✓ $\therefore$ CD passes through the mid-point. *or* $-5 = 5x - 20$ $\therefore 5x = 15$ $\therefore x = 3$ ✓	✓mid-point ✓substitute x **or** y ✓correct result NB only one of x or y may be substituted. If both are substituted, then BD and max 2/3. (3)

[13]

3.1.1.	Positive ✓	✓answer (1)
3.1.2.	Positive ✓	✓answer (1)
3.1.3.	Negative ✓	✓ answer (1)
3.2.1.	0,07✓✓	✓answer ✓d.p. [0,0697…] (2)
3.2.2.	0,18✓	✓answer [0,1801788...] (1)
3.3.	cosec B =1,1 $\therefore \frac{1}{\sin B} = 1,1$ ✓ $\therefore \sin B = \frac{10}{11}$ ✓ $\therefore B = 65,38°$ ✓	✓reciprocal ratio ✓invert *[sin B=0,909090…]* ✓answer *[accept 65,5°…]* (3)
3.4.	$\cos \hat{A} = \frac{AC}{AB}$ ✓ $\therefore AB = \frac{8,5}{\cos 35,7°}$ ✓ $= 10,47$✓	✓correct ratio ✓substitution ✓answer [10,46690…] (3)

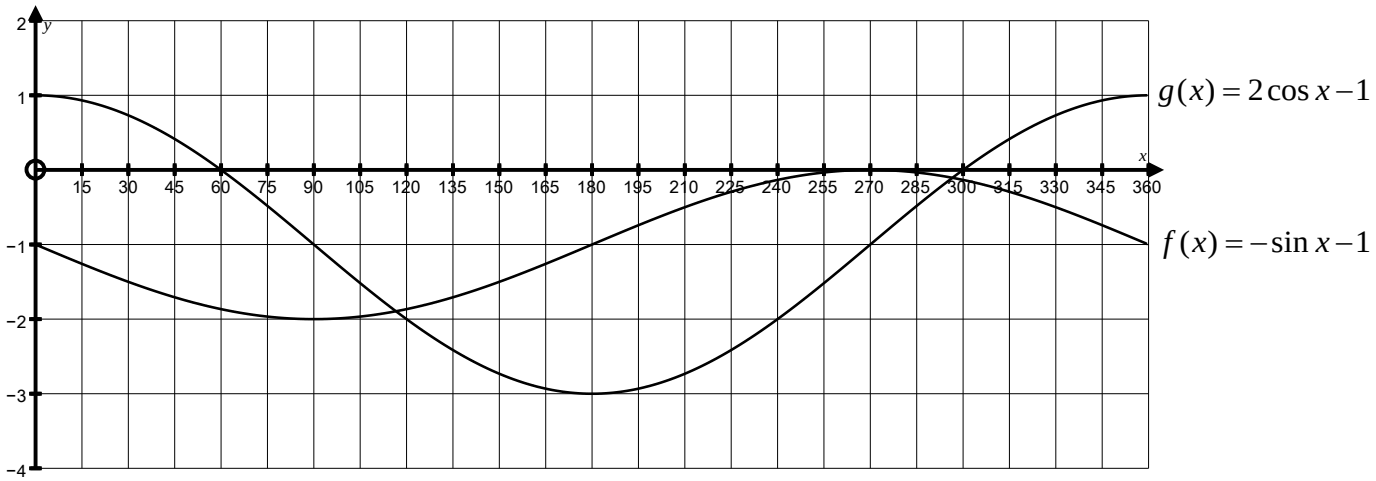
[11]

4.1.1.	  OR 	✓✓answer (2)

4.1.2.	$\frac{2\sin 30° \times \cos 45°}{2+\tan^2 60°}$ $= \frac{2\left(\frac{1}{2}\right)^{✓} \times \frac{1}{\sqrt{2}}}{2+3^{✓}}$ ✓ $= \frac{\frac{1}{\sqrt{2}}}{5}^{✓} = \frac{1}{5\sqrt{2}}$ ✓	✓sin30° ✓cos45° ✓$\tan^2 60°$ ✓simplify ✓answer - accept $\frac{\sqrt{2}}{10}$ provided $\frac{1}{5\sqrt{2}}$ appears somewhere. (5)

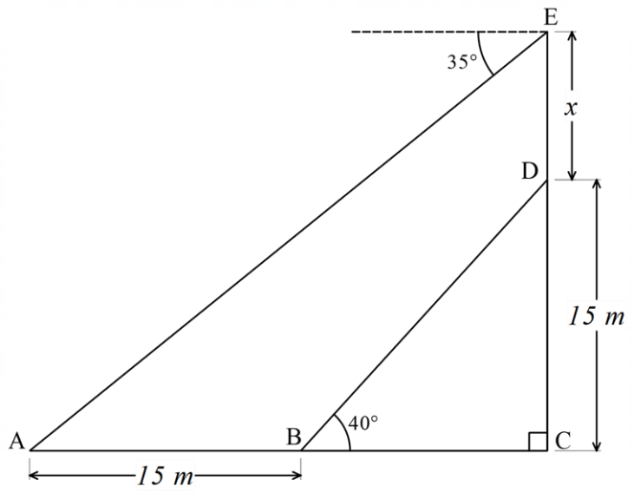
4.2.1.	2✓	✓answer (1)
4.2.2.	4✓	✓ answer (1)
4.2.3.	1✓	✓ answer (1)

[10]



5.1.	$a = -1$ ✓ $b = 2$✓ $c = -1$ ✓	✓answer ✓answer ✓answer (3)
5.2.	$y \in [-2;0]$ ✓✓	✓values ✓notation (2)
5.3.	$x \in (180°^{✓}; 270°^{✓})$	✓180° ✓270° [ignore shape of brackets] (2)
5.4.	$x = 180°$ ✓✓	✓✓answer [-1 per extra answer] (2)
5.5.	$x \in [0°^{✓}; 60°]$ or $x = 270°^{✓}$ or $x \in [300°^{✓}; 360°]$	✓✓✓per answer (3)

[12]



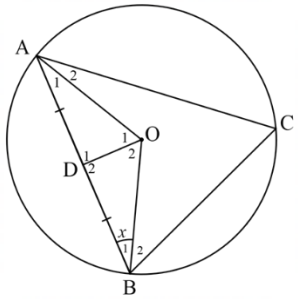
6.1.	$\tan 40° = \frac{15}{BC}$ ✓ $\therefore BC = \frac{15}{\tan 40°} = 17,88$ m✓	✓equation ✓answer [17,8763…] (2)

6.2.	35° (alternate ∠s = ; | | lines) ✓	✓ S & R

6.3.	$\tan 35° = \frac{x+15}{15+17,88} = \frac{x+15}{32,88}$ ✓ $\therefore x+15 = 23,02$ ✓ $\therefore x = 8,02$ m ✓	✓equation ✓simplify ✓answer (3)

[7]

7.1.	Constr: draw CO and extend to P ✓ Proof: let $\hat{B} = x$ $\therefore O\hat{C}B = x$ (∠s opp = sides) ✓ $\therefore P\hat{O}B = 2x$ (ext ∠ of Δ) similarly let $\hat{A} = y$ $\therefore A\hat{O}P = 2y$ ✓ $\therefore A\hat{O}B = 2x + 2y = 2(x + y) = 2A\hat{C}B$ ✓ ✓	✓constr ✓method for x ✓method for y ✓✓conclusion (5)



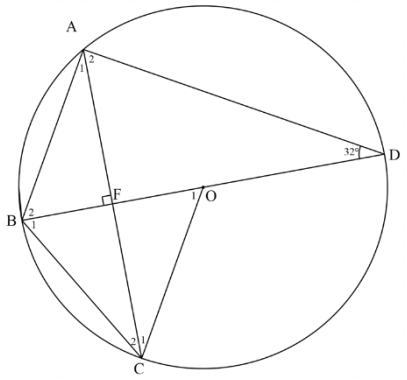
7.2.1.	A line from the centre of a circle to the mid-point of a chord is perpendicular to the chord.✓	✓answer (1)

7.2.2.	$90° - x$ ✓	✓answer (1)

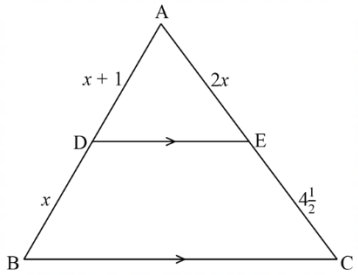
7.2.3.	∠s opp = sides; radii ✓	✓answer (1)

7.2.4.	$A\hat{O}D = 180° - 2x$ (∠s in a Δ) ✓ $\therefore \hat{C} = 90° - x$ (∠ at centre = 2×∠ at circumf) ✓ but $\hat{O}_2 = 90 - x$ $\therefore \hat{C} = \hat{O}_2$ ✓	✓S&R ✓S&R ✓conclusion (3)

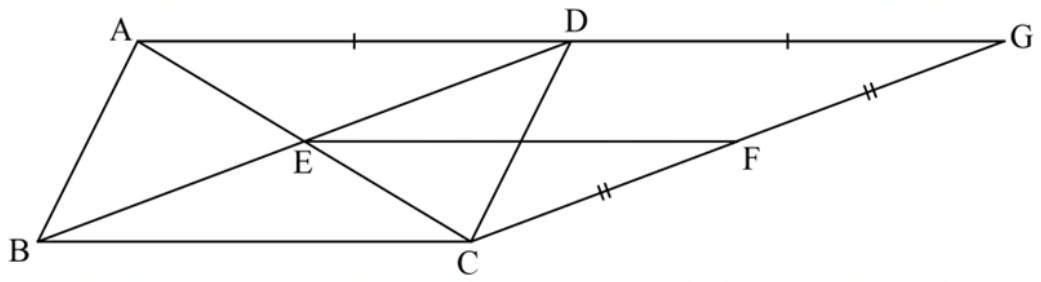
[11]



8.1.1.	$B\hat{A}D = 90°$ ✓ (∠ in semi⊙) ✓	✓S✓R (2)
8.1.2.	$\hat{A}_2 = 58°$ ($\angle s$ in Δ) ✓	✓S&R (1)
8.1.3.	$\hat{A}_1 = 32°$ ✓ $\therefore \hat{O}_1 = 64°$✓ (∠ at centre = 2× angle at circumf) ✓	✓32° *must be shown as a statement or on the diagram* ✓64° ✓R (3)
8.1.4.	$\hat{B}_1 = 58°$✓ ($\angle s$ in same segment) ✓	✓S ✓R (2)



8.2.	$\frac{AD}{BD} = \frac{AE}{EC}$ (line | | one side of Δ)/(prop int thm; DE| |BC) ✓ $\therefore \frac{x+1}{x} = \frac{2x}{4}$ ✓ $\therefore 2x^2 - 4x - 4\frac{1}{2} = 0$ $\therefore 4x^2 - 9x - 9 = 0$ ✓ $\therefore (x-3)(4x+3) = 0$ $\therefore x = 3$ (valid) ✓ *or* $x = -3/4$ (not valid) ✓	✓S&R ✓subst ✓std form ✓answer (valid) ✓answer (not valid) (5)



8.3. $EF = \frac{1}{2}AG$ ✓ ; $EF \parallel AG$ ✓ (mid-pt theorem) ✓ but BC = AD (prop of parallelogram) ✓ ∴ BC = EF ∴ BEFC is a parallelogram (1 pair sides $\parallel$ & ✓=)	✓S ✓S ✓R ✓S&R ✓R (5)

[18]

Total = 100