Name and Surname : .....

Grade/Class : 10/..... **Mathematics Teacher** : .....

Hudson Park High School

GRADE 10
MATHEMATICS

November Paper 2
2024

ANSWER BOOKLET

QUESTION 1

1.1.

22	23	24	25	26	28	29	29	30	32
32	33	34	35	36	37	37	38	39	40

10
10
20

1.1.1 $M = 32$ ✓ 1

1.1.2 $\bar{x} = \frac{22 + 23 + \ldots + 32}{20}$ ✓

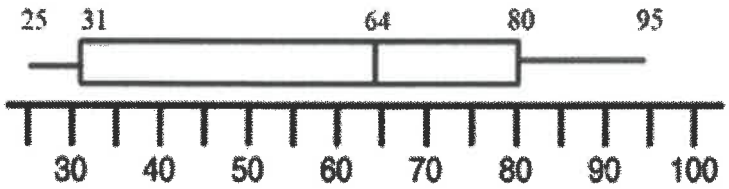
$= 31,45$ ✓ ans only 2/2 2

1.1.3 $IQR = Q_3 - Q_1$

$= 36,5$ ✓ $- 27$ ✓

$= 9,5$ ✓ 3

1.2.



31 % = Q_1

∴ 75 % ✓ 1

1.3.	$35 \times 30 = 1050$ ✓	
	$- 24 + 42$	
	$= 1068$ ✓	
	$\therefore \bar{x} = \frac{1068}{30} = 35,6$	
	$\therefore \frac{35,6}{50} \times 100$	3
	$= 71,2\%$ ✓	

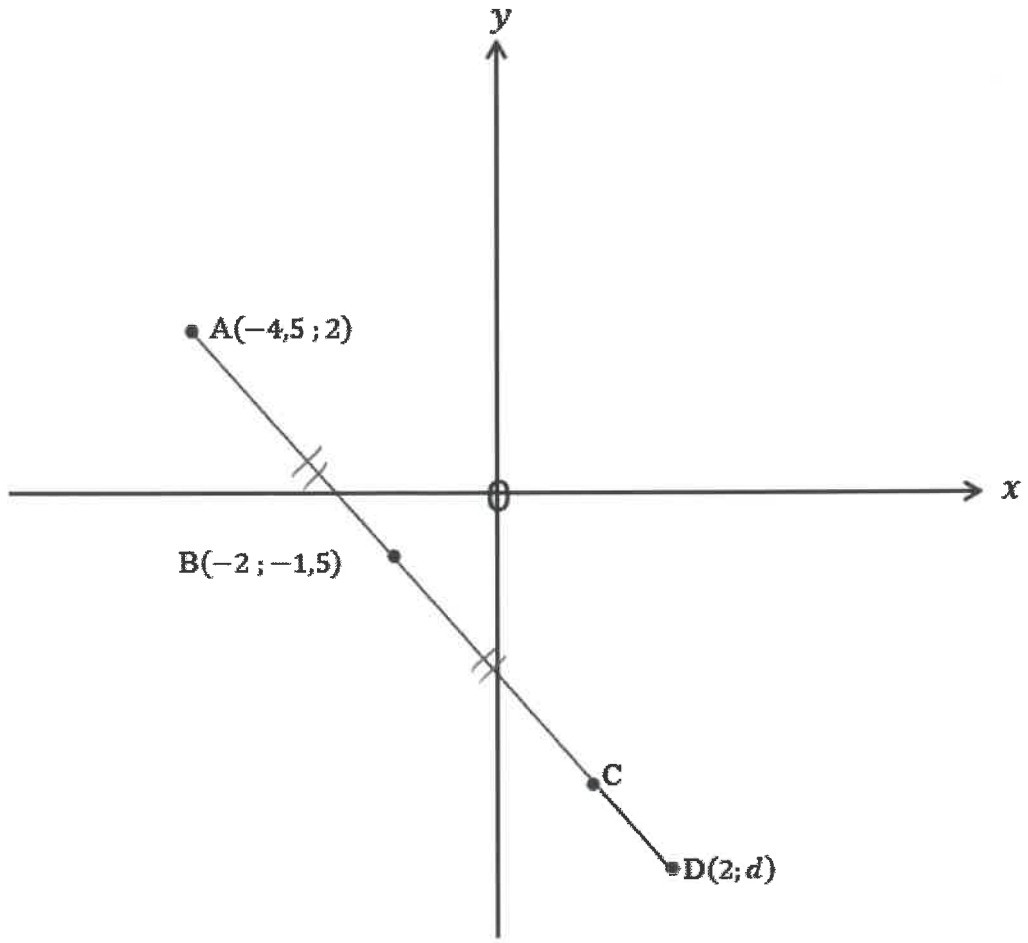
1.4.

	Wattage Interval	Frequency	
87,5	$80 \leq x < 95$	3	−3
102,5	$95 \leq x < 110$	17	−20
117,5	$110 \leq x < 125$	31	−51
132,5	$125 \leq x < 140$	16	−67
147,5	$140 \leq x < 155$	10	−77

1.4.1.	$n = 77$ ✓	1
	midpt x f	
1.4.2. (a)	$\bar{x} = \frac{87,5 \cdot 3 + 102,5 \cdot 17 + \cdots + 147,5 \cdot 10}{77}$ ✓	
	$= 120,03$ ✓ ans only 2/2	2
	(b) $P_{80} = T_{\frac{80}{100}(1+77)}$	
	$= T_{62,4}$ ✓ 62,4 $\frac{T_{62} + T_{63}}{2}$	
	$\therefore 125 \leq x < 140$ ✓	2
	ans only 1/2	

QUESTION 2

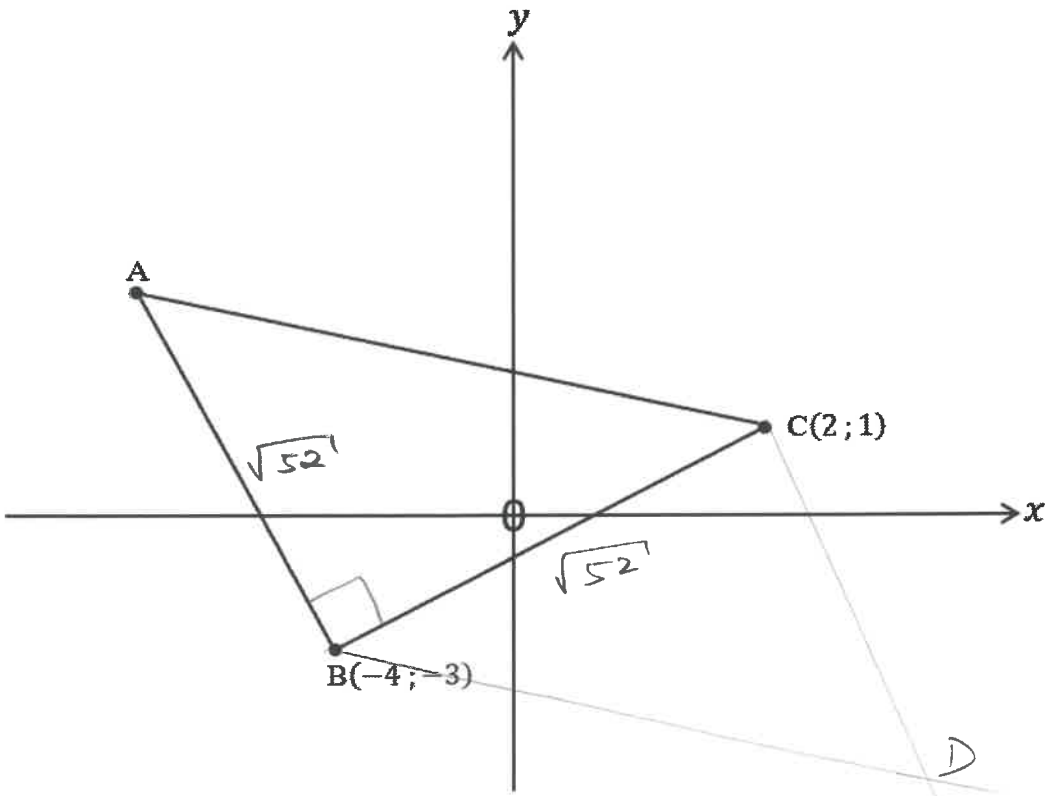
2.1.



2.1.1.	$\frac{x_c + (-4,5)}{2} = -2$ $\quad \frac{y_c + 2}{2} = -1,5$	
	$x_c - 4,5 = -4$ $\quad y_c + 2 = -3$	
	$x_c = 0,5$ $\quad y_c = -5$	
	$\therefore C(0,5 ; -5)$ ✓ ✓	2
2.1.2.	A, B, D collinear	
	$m_{AB} = \frac{-1,5 - 2}{-2 - (-4,5)} = -\frac{7}{5}$ ✓	

	$m_{BD} = \frac{d-(-1,5)}{2-(-2)} = \frac{d+1,5}{4}$ ✓	
	✓ method	
	$\therefore \quad -\frac{7}{5} = \frac{d+1,5}{4}$	
	$-28 = 5(d+1,5)$	
	$-\frac{71}{10} = d$ ✓ $\quad -7,1$	4

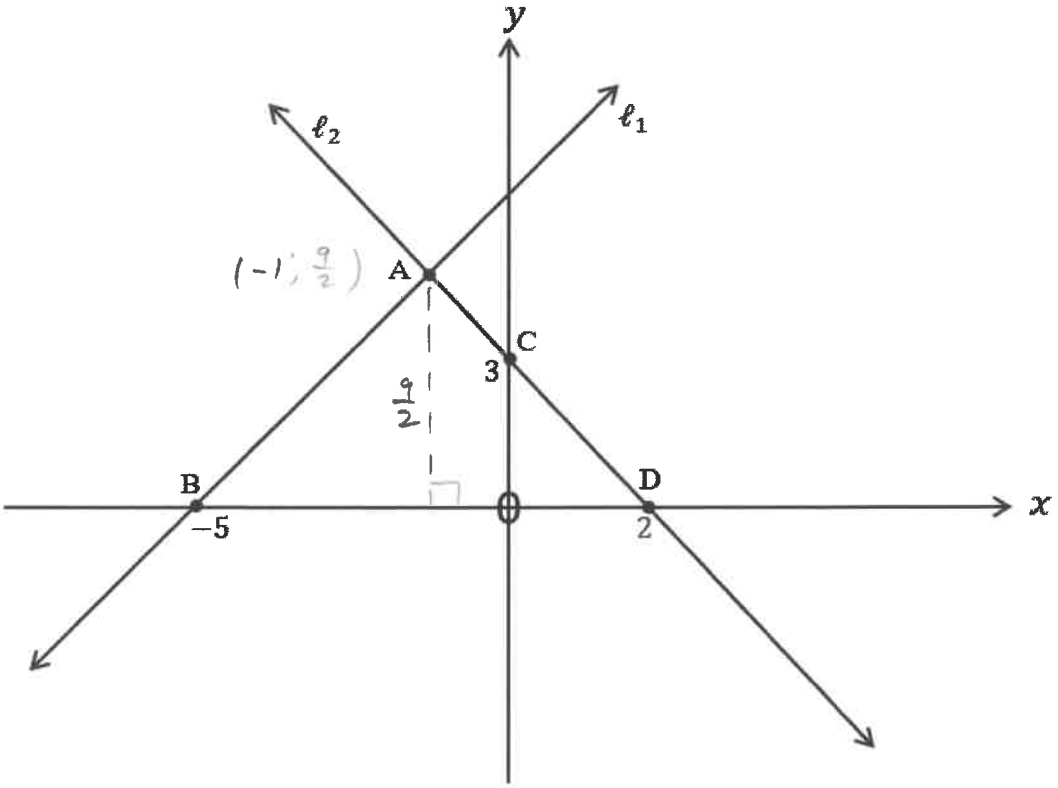
2.2.



2.2.1.	(a) $m_{BC} = \frac{1-(-3)}{2-(-4)} = \frac{2}{3}$ ✓	1
	(b) $m_{AB} = -\frac{3}{2}$ ✓ ⊥	
	$y = -\frac{3}{2}x + c$	
	Sub $B(-4;-3)$	
	$-3 = -\frac{3}{2}(-4) + c$ ✓	
	$-9 = c$	
	$\therefore y = -\frac{3}{2}x - 9$ ✓	3
2.2.2.	(a) $BC = \sqrt{(1-(-3))^2 + (2-(-4))^2}$ ✓	
	$= \sqrt{52}$ ✓	2

2.2.2.	(b) $AB = BC$ ✓S both $= \sqrt{52}$	
	$\therefore \hat{A} = \hat{C}$ ✓SR $\angle$'s opp = sides	
	$\therefore \hat{C} = 45°$ ✓SR sum $\angle$'s in $\Delta = 180°$	3
2.2.3.	$A(-8;3) \xrightarrow[2\downarrow]{10\rightarrow} C(2;1)$	
	$B(-4;-3) \xrightarrow[2\downarrow]{10\rightarrow} D(6;-5)$ ✓ ✓	2

2.3.



area Δ COD $= \frac{1}{2}(2)(3) = 3$ ✓

area Δ ABD $= \frac{1}{2}(5+2)(\frac{9}{2})$

$= \frac{63}{4}$ ✓ 15,75

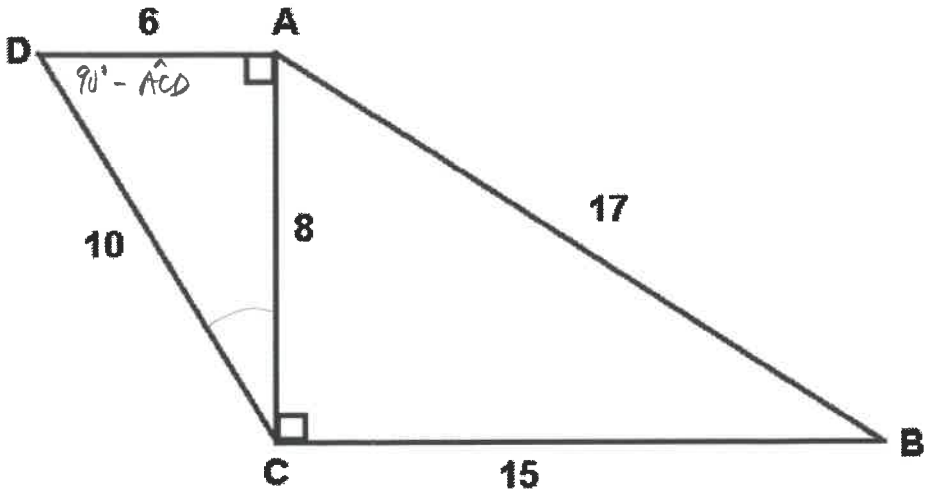
∴ area quad ACOB

$= \frac{64}{4} - 3$

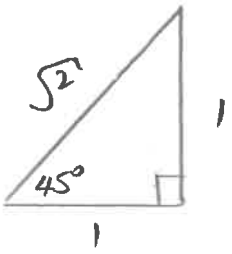
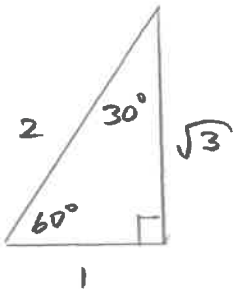
$= \frac{51}{4}$ ✓ 12,75 3

QUESTION 3

3.1.



3.1.1.	$\sin \hat{B} = \frac{8}{17}$ ✓ D — $\frac{o}{h}$	1
3.1.2.	$\sec \hat{D} = \frac{10}{6} = \frac{5}{3}$ ✓ D — $\frac{h}{a}$	1
3.1.3.	$\tan (90° - A\hat{C}D)$	
	$= \tan \hat{D}$ — sum ∠'s in Δ = 180°	
	$= \frac{8}{6}$ — $\frac{o}{a}$	
	$= \frac{4}{3}$ ✓ D	1

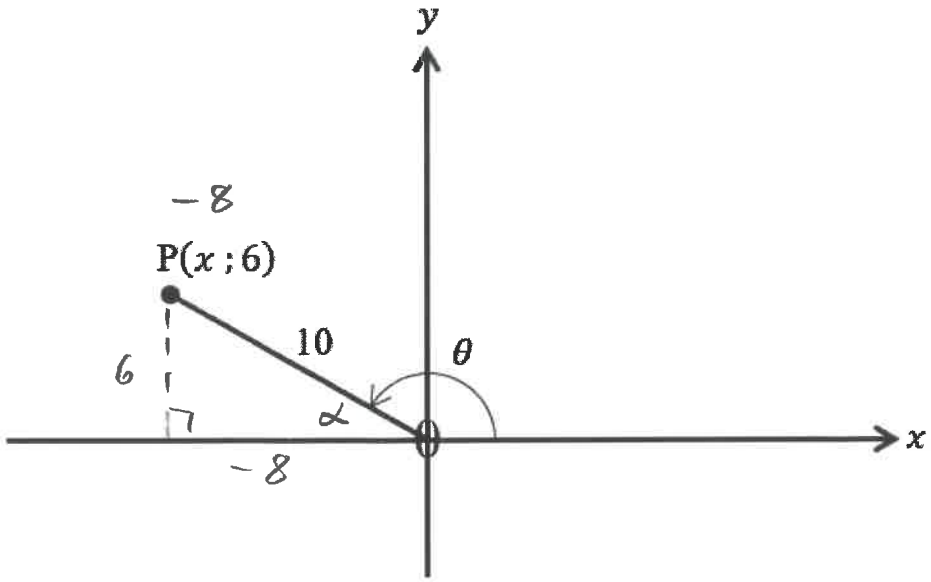
3.2.1. (a)	 ✓	1
3.2.1. (b)	 ✓	1

3.2.2. (a)	$\sin 45° = \frac{1}{\sqrt{2}}$ ✓ $\frac{o}{h}$	1
3.2.2. (b)	$\sec^2 30° - \tan^2 30°$	
	$= \left(\frac{2}{\sqrt{3}}\right)^2 - \left(\frac{1}{\sqrt{3}}\right)^2$ ✓ both ratios $\frac{h}{a}$ $\frac{o}{a}$	
	$= \frac{4}{3} - \frac{1}{3}$ ✓ squaring	
	$= 1$ ✓	3

3.3.

3.3.1.	$3\cos x + 3 = 4$	
	$\cos x = \frac{1}{3}$ ✓	
	$x = \cos^{-1}\left(\frac{1}{3}\right)$	
	$= 70,5°$ ✓	2
3.3.2.	$\sin\left(\frac{x+10°}{2}\right) = \cos(-420°)$ $\quad A = \frac{x+10°}{2}$	
	$\sin A = \frac{1}{2}$ ✓	
	$A = \sin^{-1}\left(\frac{1}{2}\right)$	
	$\frac{x+10°}{2} = 30°$ ✓	
	$x = 50°$ ✓	3
3.3.3.	$\frac{2\operatorname{cosec} x}{3} - 1 = 5$	
	$\operatorname{cosec} x = 9$ ✓	
	$\frac{1}{\sin x} = \frac{9}{1}$	
	$9.\sin x = 1$	
	$\sin x = \frac{1}{9}$ ✓	
	$x = \sin^{-1}\left(\frac{1}{9}\right)$	
	$= 6,4°$ ✓	3

3.4.

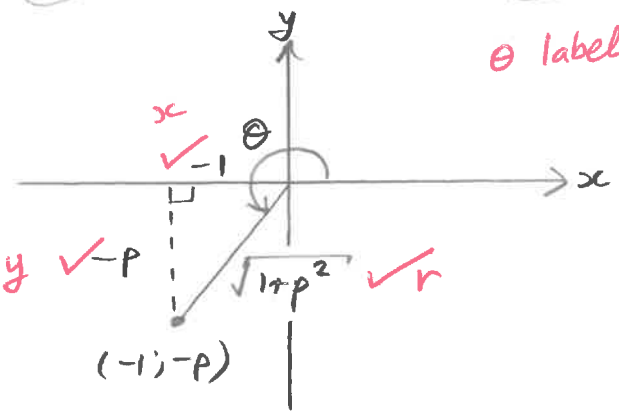


3.4.1.	$x^2 + (6)^2 = (10)^2$ Tythag	
	$x^2 = 64$	
	$x = \pm\sqrt{64}$	
	$= -8$ ✓ reject +	1
3.4.2.	$\cos\theta = \frac{-8}{10}$ $\frac{x}{r}$	
	$= -\frac{4}{5}$ ✓	1
3.4.3.	$\cos(180° - \theta)$	
	$= \cos\alpha$ sum ^'s in $\Delta = 180°$	
	$= \frac{8}{10}$ $\frac{a}{h}$	
	$= \frac{4}{5}$ +✓✓$\frac{4}{5}$	2

- if $x = +8$ (3.4.1.)
then max ½ for (3.4.3.) $\frac{4}{5}$ ✓ ½

$-\frac{4}{5}$ x 0/2

3.5.

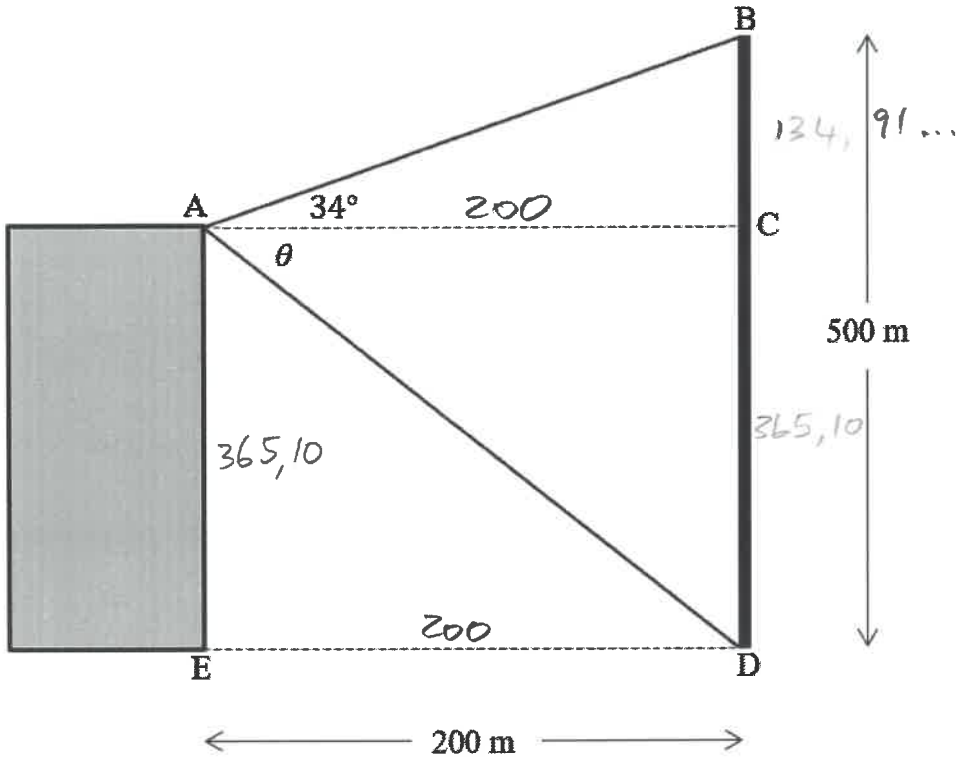
3.5.1.	$\tan\theta = p = \frac{p}{1} \quad \frac{y}{x} \quad \frac{-p}{-1}$ tan + I III 90 → 270° II III  $(-1)^2 + (-p)^2 = r^2$ Pythag $1 + p^2 = r^2$ $\pm\sqrt{1+p^2} =$ $\sqrt{1+p^2} = r$ reject -	4
3.5.2.	$\cos\theta = \frac{-1}{\sqrt{1+p^2}}$ ✓ $\frac{x}{r}$	1

QUESTION 4

4.1.1	$a = -2$ ✓A	1
4.1.2.	$b = 1$ ✓A	1
	$y = -2\cos x + 1$	
4.2.	$y \in [-1; 3]$ ✓A	1
4.3.1.	$x \in (180°; 360°)$ ✓A f decr	1
4.3.2.	$f(x) - 2 < 0$	
	$y_f < 2$ CA	
	$x \in [0°; 120°)$ or $(240°; 360°]$ ✓A ✓A	2
4.4.	f: $y = -2\cos x + 1$	
	$y = -2\cos(-x) + 1$ ✓	
	h: $y = -2\cos(-x) - 3$ ✓ ↓4	
		2

QUESTION 5

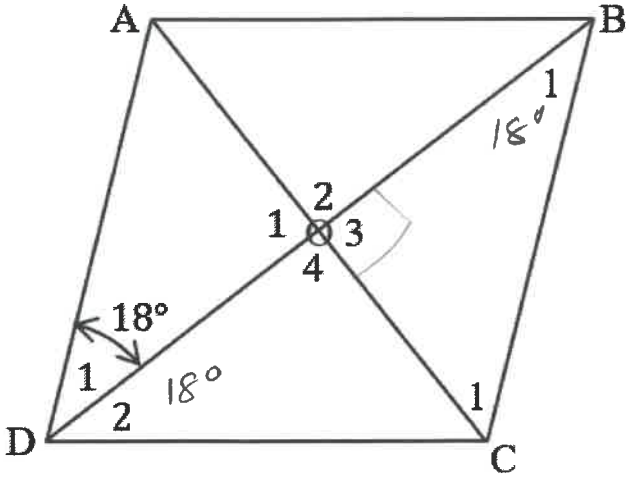
5.



5.1.	$\frac{BC}{200} = \tan 34°$ ✓	
	$BC = 200 . \tan 34°$	
	$= 134,91...$ ✓	
	$\therefore AE = 500 - 134,91...$ ✓	
	$= 365,10$ m ✓	4
5.2.	$\tan \theta = \frac{365,10}{200}$ ✓	
	$\theta = \tan^{-1}\left(\frac{365,10}{200}\right)$	
	$= 61,29°$ ✓	2

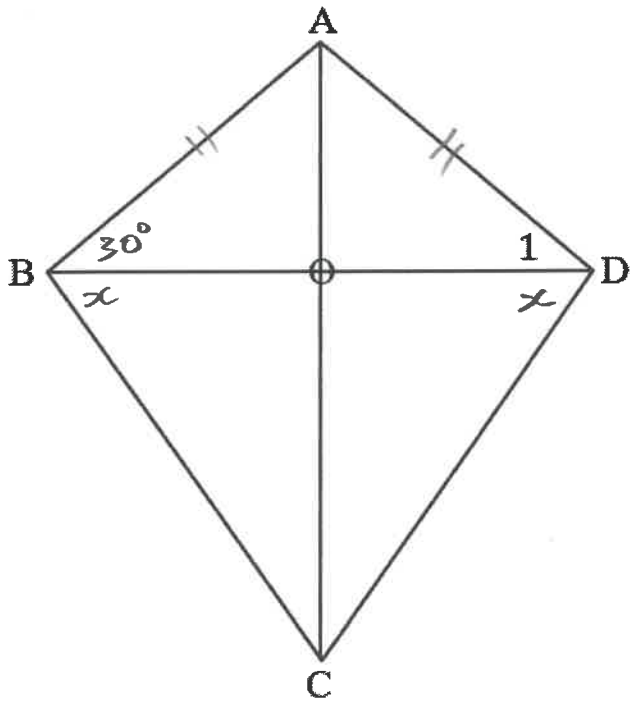
QUESTION 6

6.1



6.1.1.	$\hat{D}_2 = 18°$	✓R diags rhomb bisect int ^'s	1
6.1.2.	$\hat{B}_1 = 18°$	✓SR alt ^'s =, AD ∥ BC	1
6.1.3.	$\hat{O}_3 = 90°$	✓SR diags rhomb ⊥	
	$\therefore \hat{C}_1 = 72°$	✓SR sum ^'s in Δ = 180°	2

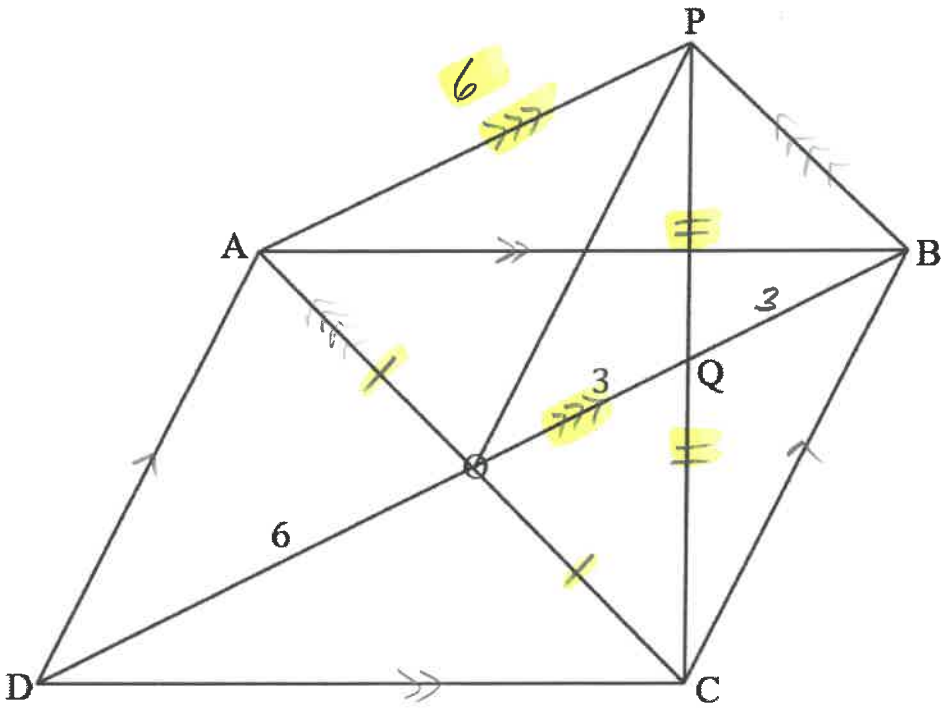
6.2.



6.2.1.	$\hat{D}_1 = 30°$ ✓SR ^'s opp = sides	1
6.2.2.	BC = CD ✓SR sides opp = ^'s	
	∴ ABCD is a kite ✓R 2 prs adj sides quad =	2

QUESTION 7

7.

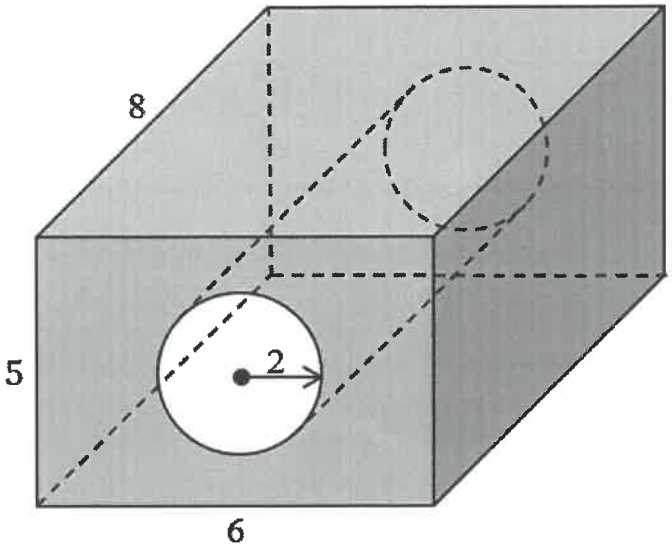


7.1.1.	AO = OC ✓SR diags ||gm bisect	
	∴ CQ = QP ✓SR line thru midpt || to 2nd side	
	∴ AP = 6 ✓S ✓R midpt thm	4
7.1.2.	QB = 3 ✓SR diags ||gm bisect	1
7.2.1.	APBO is ||gm ✓R 1 pr opp sides quad || & =	1

7.2.2.	POCB is ||gm, ✓R diags quad bisect	1
7.3.	$\Delta AOB = \Delta POB$ area	
	. same base (OB, common) ✓	
	. same height (AP ∥ OB) ✓	2

QUESTION 8

8.1.



8.1.1.	$V = 6.8.5 - \pi(2)^2.8$ ✓ ✓	
	$= 240 - 100,53...$	
	$= 139,47 \ cm^3$ ✓	3
8.1.2.	TSA	
	$= 2 \times \boxed{5}\,6 + 2 \times \boxed{8}\,5 + 2 \times \boxed{8}\,6 + \boxed{2\pi r}\,8$	
	$= 2(6.5 - \pi(2)^2) + 2.5.8 + 2.8.6 + 2\pi(2).8$ ✓ ✓ ✓	
	$= 34,86... + 80 + 96 + 100,53...$	
	$= 311,40 \ cm^2$ ✓	4

8.2.	$V = \frac{4}{3}\pi r^3$	
	$V_n = \frac{4}{3}\pi r_n^3$	
	$= \frac{4}{3}\pi (2r)^3$	
	$= \frac{4}{3}\pi . 8r^3$ ✓	
	$= 8 . \frac{4}{3}\pi r^3$	
	$= 8 . V$	
	$\therefore$ factor is $\frac{8V}{V} = 8$ ✓ → ans only 2/2	2

ADDITIONAL SPACE