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

Hudson Park High School

GRADE 10
MATHEMATICS
2025

November Paper 2

ANSWER BOOKLET

100

QUESTION 1

1.1.

x	Frequency	
$0 < x \leq 10$	3	— 3
$10 < x \leq 20$	10	— 13
$20 < x \leq 30$	18	— 31
$30 < x \leq 40$	25	—56
$40 < x \leq 50$	13	69
$50 < x \leq 60$	7	—76

1.1.1.	$\bar{x} = \dfrac{5 \times 3 + 15 \times 10 + 25 \times 18 + 35 \times 25 + 45 \times 13 + 55 \times 7}{76}$ $= \dfrac{2460}{76}$ ✓midpt $\times$ by f ✓ $= 32,37$ ✓	**3** ③
1.1.2.	$P_{81} = T_{\frac{81}{100}(1+76)}$ $= T_{62,37}$ ✓ $\dfrac{T_{62} + T_{63}}{2}$ $= \dfrac{45 + 45}{2}$ $40\sim50$ ∴ 45 $= 45$ ✓	**2** ②
1.2.	Total mark $= 30 \times 63 - 18 + 81$ ✓ $= 1953$ ✓ ∴ $\bar{x}_{new} = \dfrac{1953}{30}$ $= 65,1 \%$ ✓	**3** ③

1.3.

| | 30 | 40 | 55 | 80 | 100 |

1.3.1.		
	$5 - IQR = \dfrac{80 - 40}{2}$ ✓ num	
	$= 20$ ✓	2
		②

1.3.2.		
	$n = \dfrac{1}{4} \times 24$ ✓ 25 % of data	
	$= 6$ ✓	2
		②

1.4.		
	$T_1 \ ; \ T_2 \ ; \ T_3 \ ; ... ; \ T_{112}$ $T_n = 2n - 3.$	
	$M = T_{\frac{1}{2}(1+112)} = T_{56,5}$	
	$\therefore$ upper list $T_{57} \ ; \ ... \ ; \ T_{112}$	
	$Q_3 = T_{\frac{1}{2}(57+112)} = T_{84,5}$	
	$\qquad\qquad\qquad = \dfrac{T_{84} + T_{85}}{2}$ ✓	
	$T_{84} = 2(84) - 3 \qquad T_{85} = 2(85) - 3$	
	$\qquad = 165 \qquad\qquad = 167$ ✓ both	
	$\therefore Q_3 = \dfrac{165 + 167}{2}$	
	$\qquad = 166$ ✓	3
		③

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2.
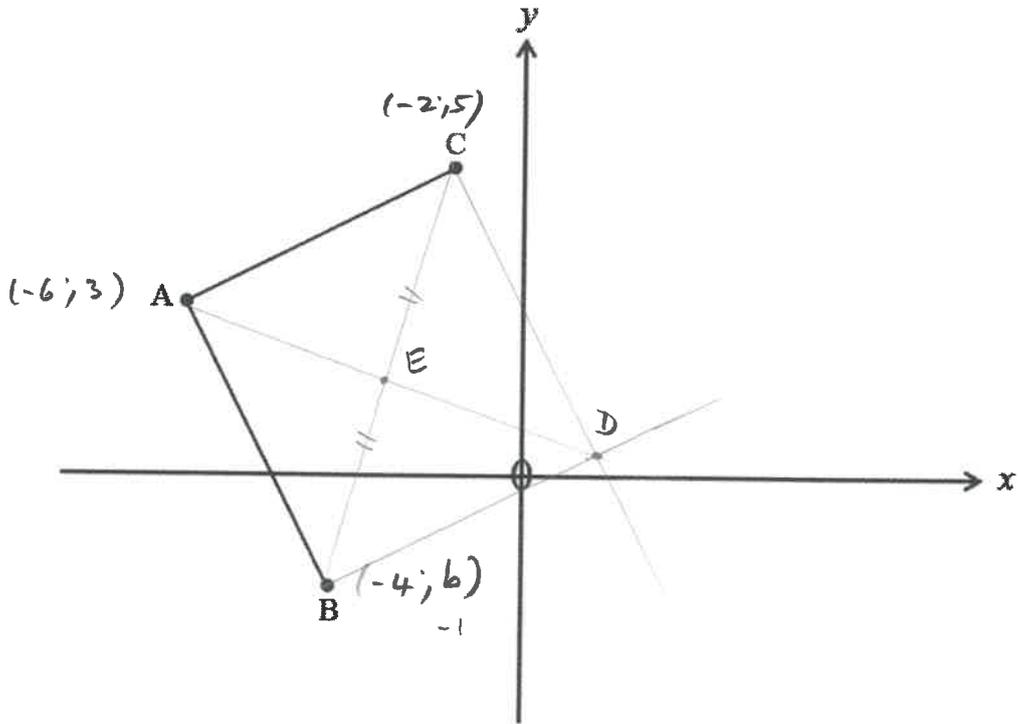
2.1.	
	$m_{AC} = \dfrac{5-3}{-2-(-6)} = \dfrac{1}{2}$ ✓ $\qquad\qquad AC$
	$y = \dfrac{1}{2}x + c$
	$\text{Sub} \quad (-6, 3) \qquad 3 = \dfrac{1}{2}(-6) + c$ ✓ sub
	$6 = c$
	$\therefore \quad y = \dfrac{1}{2}x + 6$ ✓
	$\times 2: \quad 2y = x + 12$
	$0 = x - 2y + 12 \quad \boxed{OR} \qquad -x + 2y - 12 = 0$ **4** ✓
	(4)
2.2.	
	$AC = \sqrt{(5-3)^2 + (-2-(-6))^2} = \sqrt{20}$ ✓
	$AB = \sqrt{(b-3)^2 + (-4-(-6))^2} = \sqrt{(b-3)^2 + 4}$ ✓
	$AC = AB$
	$\sqrt{20} = \sqrt{(b-3)^2 + 4}$
	sbs $\qquad 20 = (b-3)^2 + 4$ ✓ PTO

2.2. cont.	$16 = (b-3)^2$	
	$\pm 4 = b-3$ NB	
	$\therefore \quad 4 = b-3 \quad or \quad -4 = b-3$	
	$7 \not= b \qquad\qquad -1 = b$	4
	reject $Q\,III$	
	OR $\quad 0 = b^2 - 6b - 7$	
	$0 = (b-7)(b+1)$	
		④

2.3.	$m_{AC} = \dfrac{1}{2} \quad (2.1.) \quad m_{AB} = \dfrac{-1-3}{-4-(-6)} = -2\ \checkmark$	
	$m_{AB} \cdot m_{AC} = (-2) \times \left(\dfrac{1}{2}\right) = -1\ \checkmark$	
	$\therefore \quad AB \perp AC$	3
		③

2.4.	$A(-6 ; 3) \quad \xrightarrow[2\ \uparrow]{4\ \rightarrow} \quad C(-2 ; 5)$	
	$B(-4 ; -1) \quad \xrightarrow[2\ \uparrow]{4\ \rightarrow} \quad D(0 ; 1)$	2
	$\checkmark \qquad \checkmark$	②

2.5.	$CE = EB \quad \checkmark^R$ diags square bisect	
	$x_E = \dfrac{-2 + (-4)}{2} \qquad\qquad y_E = \dfrac{-1 + 5}{2}$	
	$= -3 \qquad\qquad\qquad = 2$	3
	$\therefore \quad E(-3 ; 2)$	
	$\checkmark \qquad \checkmark$	③

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QUESTION 3

3.1.
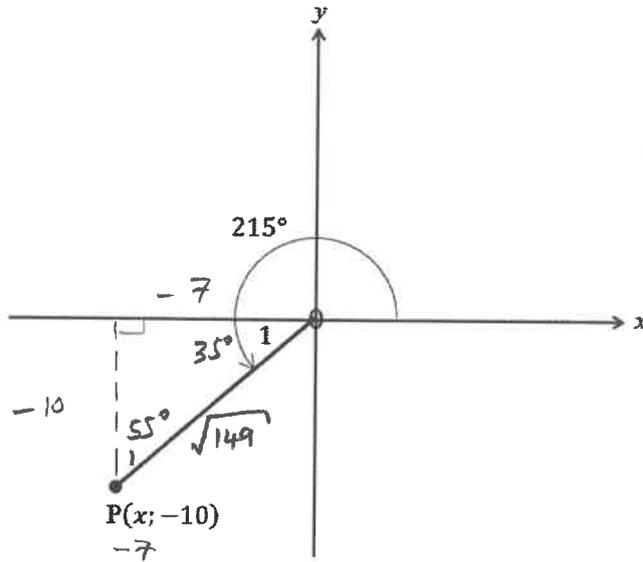
3.1.1.	$x^2 + (-10)^2 = (\sqrt{149})^2$ $\qquad$ Pythag		
	$x^2 = 49$		
	$x = \pm 7$		$\mid$
	$\therefore \underline{x = -7}$ ✓ S		①
3.1.2.	$\hat{O}_1 = 35°$ ✓ S $\qquad$ ∧'s on str line $= 180°$		$\mid$
			①
3.1.3.(a)	$\sin 215° = \dfrac{y}{r}$		
	$\qquad = \dfrac{-10}{\sqrt{149}}$ ✓		$\mid$
			①
3.1.3.(b)	$\hat{P}_1 = 55°$ $\qquad$ sum ∧'s in $\triangle = 180°$		
	$\cos 55° = \dfrac{a}{h}$		$\mid$
	$\qquad = \dfrac{10}{\sqrt{149}}$ ✓		①

3.2.		
	$\sin \theta = -\dfrac{1}{2} \quad \dfrac{y}{r} \qquad$ III IV $\quad \dfrac{-1}{2} \quad \cancel{\dfrac{1}{2}}$	
	cos $+ \qquad$ I IV	

$$x^2 + (-1)^2 = (2)^2$$
$$\text{pythag}$$
$$x^2 = 3$$
$$x = \pm\sqrt{3}$$
$$\therefore x = \sqrt{3}$$

(graph with θ, $\sqrt{3}$, -1, 2, point $(\sqrt{3}; -1)$)
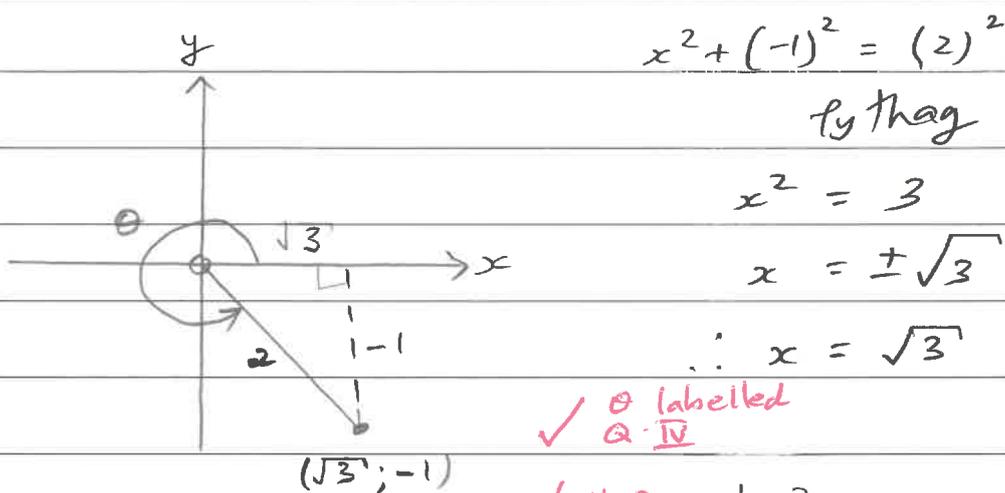
✓ θ labelled Q.IV

✓ $y, r \qquad -1, 2$

✓ $x \qquad \sqrt{3}$

3

③

3.3.		
	$\cot 10° = \dfrac{k}{1} \quad \dfrac{x}{y}$	

(graph with point $(k; 1)$, $\sqrt{k^2+1}$, $10°$, k)
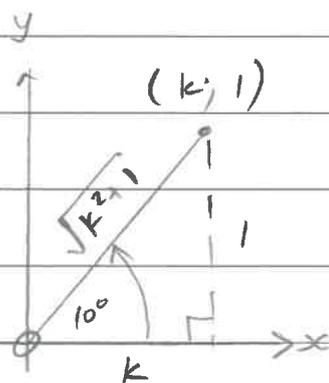
$$(k)^2 + (1)^2 = r^2$$
$$\text{pythag}$$
$$\sqrt{k^2+1} = r$$

✓ $x, y \qquad k, 1$

✓ $r \qquad \sqrt{k^2+1}$

$$\sec^2 10° - 1 = (\sec 10°)^2 - 1$$
$$= \left(\frac{r}{x}\right)^2 - 1$$
$$= ✓\left(\frac{\sqrt{k^2+1}}{k}\right)^2 - 1$$
$$= \frac{k^2+1}{k^2} - 1 \qquad\qquad \frac{1}{1}$$
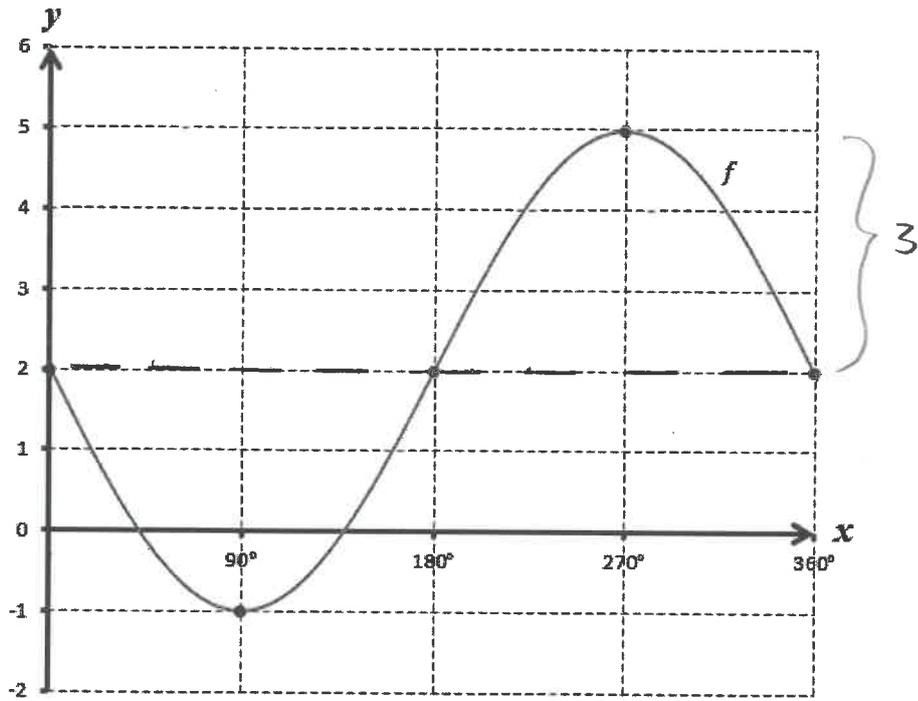$$= \frac{k^2+1-k^2}{k^2}$$
$$= \frac{1}{k^2} \quad ✓$$

4

④

3.4.1.

$$5 \sec 75° = 5 \cdot \frac{1}{\cos 75°}$$

$$= 19,32 \checkmark$$

1

①

3.4.2.

$$\frac{\cot^2(20° - 75°)}{\csc 75° - 10} = \frac{\left(\frac{1}{\tan(-55°)}\right)^2}{\frac{1}{\sin 75°} - 10}$$

$$= -0,05 \checkmark\checkmark \text{ or } 0$$

2

②

3.5.1.

$$\frac{\sin x}{5} = \frac{\sin 40°}{7}$$

$$\sin x = 0,45 \ldots \checkmark$$

$$x = \sin^{-1}(0,45 \ldots)$$

$$= 27,33° \checkmark$$

2

②

3.5.2.

$$12^2 = 10^2 + 11^2 - 2 \cdot 10 \cdot 11 \cos x$$

$$-77 = -220 \cos x$$

$$\therefore \cos x = \frac{7}{20} \checkmark$$

$$x = \cos^{-1}\left(\frac{7}{20}\right)$$

$$= 69,51° \checkmark$$

2

②

3.5.3.	let $A = \frac{x}{3}$ $\qquad$ $3\tan A = 1$	
	$\tan A = \frac{1}{3}$ ✓	
	$A = \tan^{-1}\left(\frac{1}{3}\right)$	
	$\frac{x}{3} = 18,43...°$	
	$x = 55,30°$ ✓	3
		③
3.5.4.	$2\sec x - 3 = 0$	
	$\sec x = \frac{3}{2}$ ✓	
	$\frac{1}{\cos x} = \frac{3}{2}$	
	$2 = 3\cos x$	
	$\frac{2}{3} = \cos x$ ✓	3
	$\cos^{-1}\left(\frac{2}{3}\right) = x$	
	$48,19° = x$ ✓	③

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QUESTION 4

4.1.

4.1.1.(a)	$y = a \sin x - b$	
	$y = -3 \sin x + 2$	
	$a = -3$ $\qquad$ $-b = 2$	
	$\qquad$ $b = -2$	
		②
4.1.1.(b)	f : $\qquad y \in [-1, 5]$	
	$x-5$: $\qquad y \in [5, -25]$ $\times \times \times$	
	$\therefore y \in [-25, 5]$	
	$+4$ $\qquad y \in [-21, 9]$ ✓ A $\qquad g$	
		①
4.1.2.	Amp $= 3$ ✓	
		①

4.2.
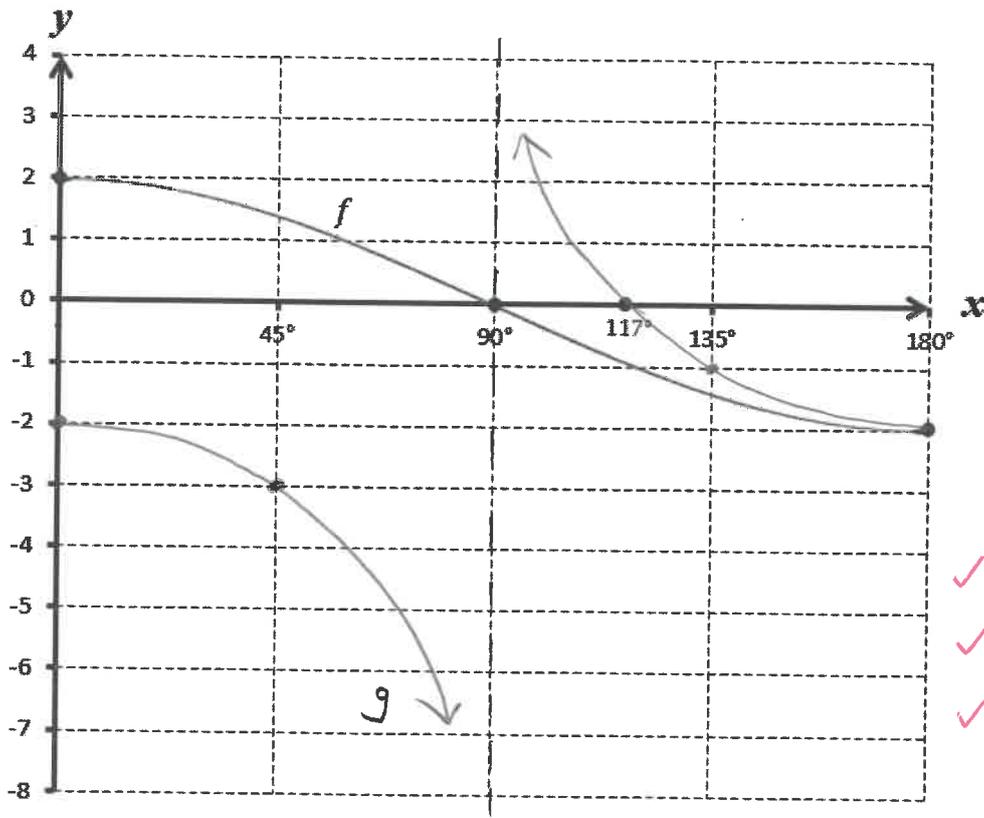
4.2.1.	$360°$ ✓	
		①
4.2.2.	See graph	
		3
4.2.3.(a)	$y_f - y_g \geqslant 0$	
	$\qquad y_f \geqslant y_g \qquad$ f above $= g$	
	$\therefore \; x \in [0°; 90°) \quad$ or $\quad x = 180°$	
	$\quad\quad ✓A \quad\quad\quad\quad ✓A$	②
4.2.3.(b)	$y_f \times y_g \quad -$	
	$\therefore \; x \in (0°; 90°) \;$ or $\; (90°; 117°)$	
	$\quad\quad ✓A \quad\quad\quad\quad ✓A$	②

• NO C.A   4.2.3 (a) (b)

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QUESTION 5

5.
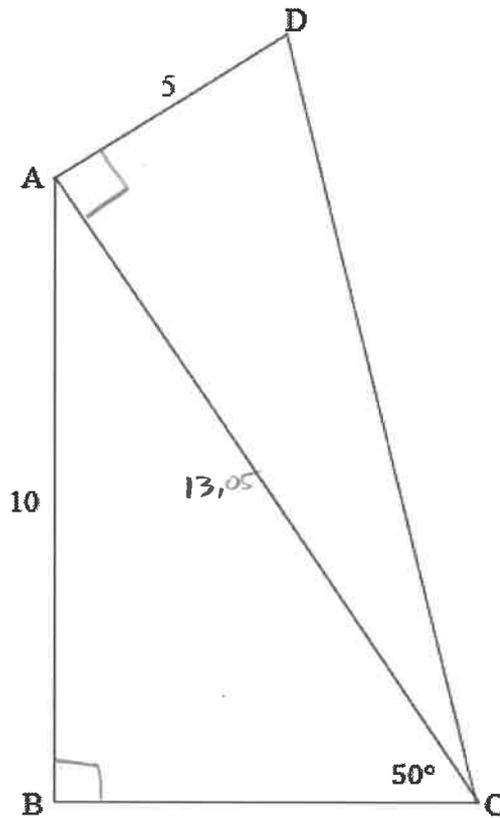
5.1.	$\dfrac{10}{AC} = \checkmark \sin 50°$ $\quad\quad \dfrac{o}{h}$	
	$10 = AC \cdot \sin 50°$	
	$\dfrac{10}{\sin 50°} = AC$	
	$13,05 = \checkmark$	
		(2)
5.2.	$\dfrac{13,05}{5} = \tan \hat{D}$ $\checkmark$	
	$\dfrac{261}{100} =$	
	$\tan^{-1}\left(\dfrac{261}{100}\right) = \hat{D}$	
	$69,04° = \checkmark$	
		(2)

[4]

QUESTION 6

6.1.
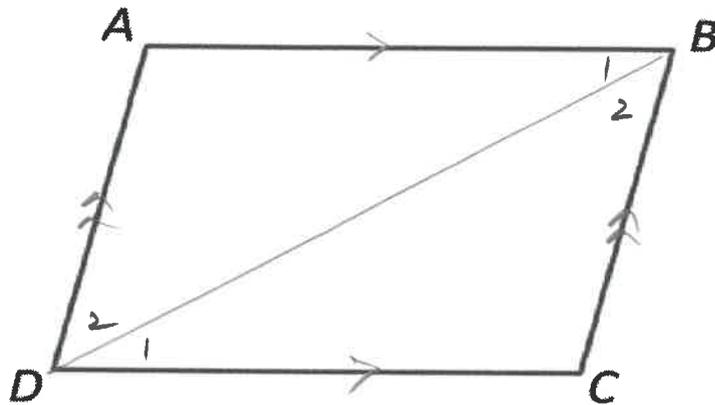
	In △'s DAB, BCD		
✓	1. BD = BD	Common	
✓ {	2. $\hat{B}_1 = \hat{D}_1$	alt $\angle$'s =, AB // DC	
{	3. $\hat{D}_2 = \hat{B}_2$	alt $\angle$'s =, AD // BC	
	∴ △ DAB ≡ △ BCD ✓s ✓ᵃ AA con S		4
	∴ AB = CD D̂AB̂ ≡ B̂ĈD̂		
			④

6.2.

A 30°

F 30° 1 / 2 / 3 / 4   35°²

E 30° 1 / 2   35°²

$AC = EC$

9 (on AF)   9 (on FE)   G

B 1/2   9   35°   9

C 1/2/3   35°   D 1/2

6.2.1.(a)	$GC = 9$ cm $\quad$ ✓SR $\quad$ diags ‖gm bisect	1
		(1)
6.2.1.(b)	$\hat{C}_2 = 35°$ $\quad$ ✓SR $\quad$ alt ∠'s =, ED ‖ FC	1
		(1)
6.2.2.	$BF = GC$ $\quad$ ✓S $\quad$ both = 9	
	$\hat{F}_2 = \hat{C}_2$ $\quad$ both = 35°	
	∴ $BF ‖ GC$ $\quad$ ✓SR $\quad$ alt ∠'s =	
	∴ $\underline{BCGF}$ is a $\quad$ 1 pr opp sides	3
	$\underline{‖gm}$ $\quad$ ✓R $\quad$ quad = & ‖	
		(3)

6.2.3.	$\hat{E}_1 = 30°$ ✓ s ✓ R ^'s opp = sides	
	$\hat{F}_1 = 30°$ ✓ SR Corr ^'s = , BF ∥ CG	
	∴ $\hat{A} = \hat{F}_1$ both = 30°	
	∴ AB = FB ✓ R sides opp = ^'s	4
		④

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7.
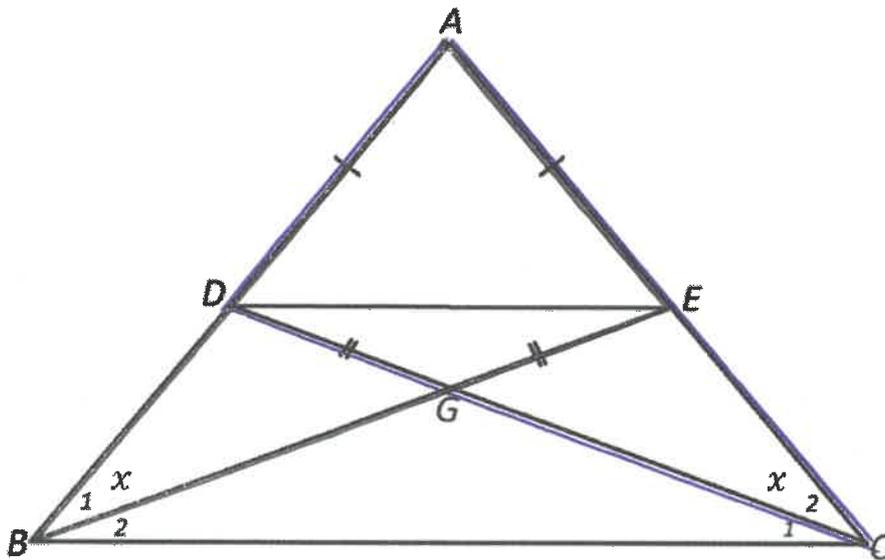
7.1.	In $\triangle$'s A B E , A C D		
	1. $\hat{A} = \hat{A}$ common ✓ SR		
	2. $AE = AD$ given ✓ S	3	
	3. $\hat{B}_1 = \hat{C}_2 = x$ given		
	$\therefore \triangle ABE \equiv \triangle ACD$ AA con S ✓ R		
		3	
7.2.	$\triangle DGB = \triangle ABE - ADGE$ ✓		
	$\triangle EGC = \triangle ADC - ADGE$		
	area $\triangle ABE =$ area $\triangle ADC$ $\triangle ABE \equiv \triangle ACD$ ✓	3	
	$ADGE$ is common ✓		
	$\therefore$ area $\triangle DGB =$ area $\triangle EGC$		
		3	

[6]

QUESTION 8

8.1.
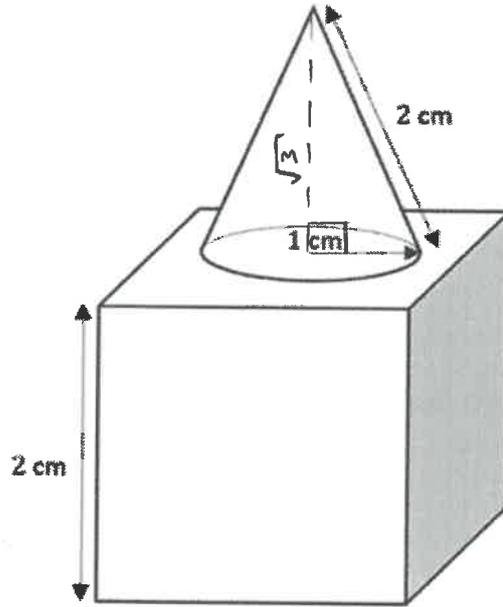
8.1.1.	$h^2 + (1)^2 = (2)^2$ ✓SR Pythag	
	$h^2 = 3$	2
	$h = \sqrt{3}$ cm ✓S h +	
		②
8.1.2.	$V = \frac{1}{3}\pi r^2 h + s^3$	
	$= \frac{1}{3}\pi(1)^2(\sqrt{3})$ ✓ $+ (2)^3$ ✓	
	$= 9,81$ cm^3 ✓	3
		③

8.2.
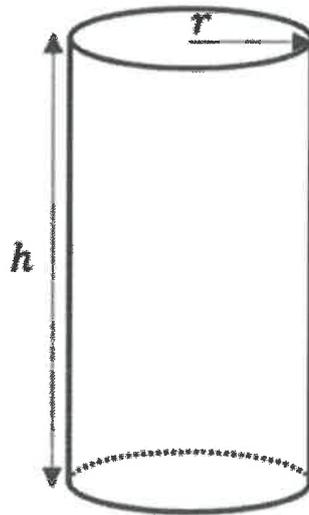
8.2.1.	$V = \pi r^2 h$	
	$275 = \pi r^2 h$ ✓	
	$h = \dfrac{275}{\pi r^2}$ cm ✓	2
		②

8.2.2.	$TSA = 2 \times \pi r^2 + 2\pi r h$ ✓ correct f	
	$= 2\pi r^2 + 2\pi r \left(\dfrac{275}{\pi r^2}\right)$ ✓ sub h	
	$= 2\pi r^2 + \dfrac{550}{r}$	
	$= 2\pi r^2 + 550 r^{-1}$	2
		②

8.3.
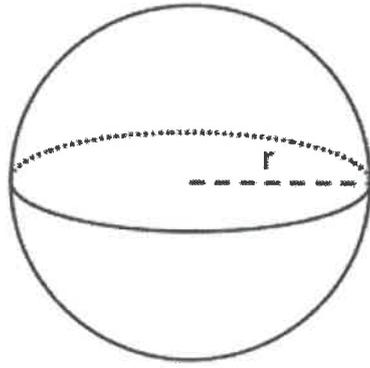
$A = 4\pi r^2$		
$A_{new} = 4\pi r_{new}^2$		
$= 4\pi(3r)^2$ NB $(\ )$	1
$= 4\pi \cdot 9r^2$	
$= 9 \cdot 4\pi r^2$	
$= 9 \cdot A$	
$\therefore$ factor of 9 ✓	1

[10]

ADDITIONAL SPACE