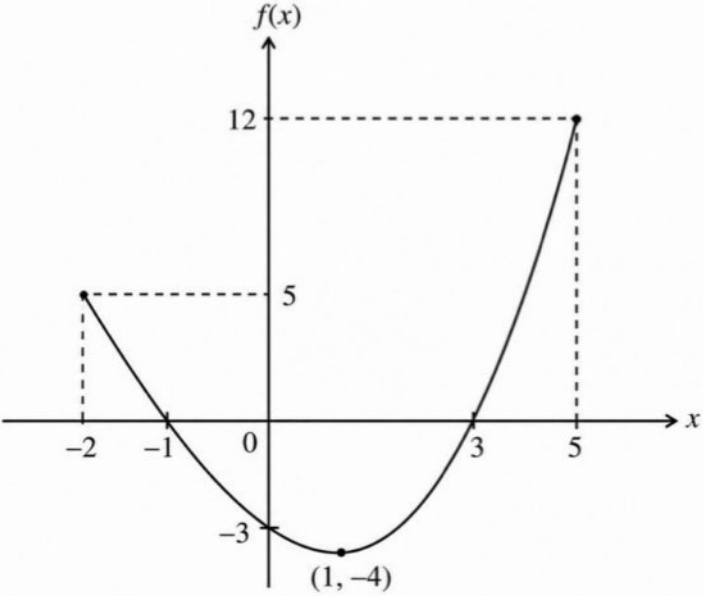


PENYELESAIAN / SOLUTIONS:

KERTAS 1 / PAPER 1:

No		Skema Pemarkahan	Sub Markah	Jumlah Markah
1	(a)	$f(x) = x^2 - 2x + \left(\frac{-2}{2}\right)^2 - \left(\frac{-2}{2}\right)^2 - 3$	1	
		$f(x) = (x - 1)^2 - 4$	1	
		$a > 0$, nilai minimum / <i>minimum value</i> = -4	1	
	(b)	 * Graf bentuk U dijumpai & paksi-x dan paksi-f(x) dilukis dengan pembaris & x, f(x) dan asalan dilabel <i>U-shaped graph is obtained & x-axis and f(x)-axis are drawn with ruler & x, f(x) and origin are labelled</i> * Titik minimum & 2 titik yang lain (1 kiri, 1 kanan) & Graf dalam domain $-2 \leq x \leq 5$. <i>The minimum point and two other points (one on the left and one on the right) are shown, for the graph in the domain $-2 \leq x \leq 5$.</i> $-4 \leq f(x) \leq 12$	1 1 1	

2	(a)	$\frac{p^n}{(a+b)^m} - \frac{p^{n-1}}{(a+b)^{m-1}}$ $= \frac{p^n}{(a+b)^m} - \frac{p^n \cdot p^{-1}}{(a+b)^m (a+b)^{-1}} \text{ atau/or } \frac{p^n}{(a+b)^m} - \frac{\frac{p^n}{p}}{(a+b)^m}$ <i>*Hukum indeks diaplikasikan/ Law of indices are applied</i> $= \frac{p^n - p^{n-1}(a+b)}{(a+b)^m} \text{ atau/or } \frac{p^n(p-(a+b))}{p(a+b)^m}$ $= \frac{p^{n-1}}{(a+b)^m} (p-a-b)$	1 1 1	
	(b)	$\frac{(\frac{2}{\sqrt{x}} + 3x\sqrt{x})\sqrt{x}}{(2\sqrt{x} + \frac{4}{\sqrt{x}})\sqrt{x}} = x + 1$ $\frac{2+3x^2}{2x+4} = x + 1$ $x^2 - 6x - 2 = 0$ $x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(-2)}}{2(1)}$ $x = 3 \pm \sqrt{11}$ $x > 0, x = 3 + \sqrt{11} \text{ atau/or } 6.317$	1 1 1	6
3		$\log_a x^2 - \log_a 4 = \log_a (y - 1)$ $\log_a \frac{x^2}{4} = \log_a (y - 1)$ $\frac{x^2}{4} = y - 1$ $x = \sqrt{4(y - 1)}$ $x = 2\sqrt{y - 1}$	1 1 1 1	4
4	(a)	${}^nC_n = \frac{n!}{n!(n-n)!}$ $= 1$	1 1	
	(b)	$k = 1, 2, 3, 4, 5, 6, 7, 8$	1	
	(c)	$n = x + (2x - 3)$ $n = 3x - 3$	1 1	5
5	(a)	$3! \times 4! \times 2! \times n! = 1728$ $288 \times n! = 1728$ $n! = 6$ $n = 3$	1 1	
	(b) (i)	${}^4C_2 \times {}^2C_1 \times {}^3C_1 @ {}^4C_1 \times {}^2C_2 \times {}^3C_1 @ {}^4C_1 \times {}^2C_1 \times {}^3C_2$	1	
		72	1	



		(ii)	${}^4C_3 \times {}^5C_1 + {}^4C_4 \times {}^5C_0$ 21	1 1	6
6	(a)	(i)	$\frac{1}{2} = \frac{2}{x+1}$ $x = 3$	1 1	
		(ii)	$x = \frac{2}{x+1}$ $(x-1)(x+2) = 0$ $x = 1, x = -2$	1 1	
	(b)	(i)	$g\left[\frac{2}{x+1}\right] = \frac{4-2x}{x+1}$ $Let\ y = \frac{2}{x+1}$ $x = \frac{2-y}{y} @\ x = \frac{2}{y} - 1$ $g(y) = \frac{4-2\left(\frac{2}{y}-1\right)}{\frac{2}{y}-1+1}$ $g(x) = 3x-2$ (ii) Ya, kerana fungsi g merupakan fungsi satu dengan satu. <i>Yes, because g is a one-to-one function.</i>	1 1 1	7
7	(a)		$2\pi rh + 2\pi r^2 = 300$ $h = \frac{150 - \pi r^2}{\pi r}$ (tertunjuk/ shown)	1	
	(b)		$V = \pi r^2 \left(\frac{150 - \pi r^2}{\pi r}\right)$ $V = 150r - \pi r^3$ $\frac{dV}{dr} = 150 - 3\pi r^2$ $150 - 3\pi r^2 = 0$ $r = \sqrt{\frac{50}{\pi}} \approx 4$ $r = 4, h = 8$ Isipadu maksimum / Maximum volume $3.142(4)^2(8) = 402.176\text{ cm}^3$	1 1 1	
				1	
8	(a)	(i)	$\cos^{-1}\left(\frac{32}{40}\right)$ atau/ or 36.87° or $2 \times 36.87^\circ$ $\approx 1.29\text{ rad}$ (tertunjuk / shown)	1 1	5

		(ii) $S = 40(1.29)$ $= 51.6 \text{ cm}$	1	
	(b)	Luas segmen AXB / <i>Area of segment AXB</i> $= \frac{1}{2}(40)^2(1.29) - \frac{1}{2}(40)(40) \sin 73.74^\circ$ $= 264.00 \text{ cm}^2$ Luas keratan rentas di bawah permukaan air / <i>Area of the cross-section below the water surface</i> $= \pi(40)^2 - 264.00$ $= 4763.20 \text{ cm}^2$	1 1	
	(c)	$\frac{4763.20 \times t}{3.142 \times 40^2 \times t} \times 100\%$ 94.75%	1 1	8
9	(a)	$y = 2\left(\frac{1}{x^2}\right) + 3$ $X = \frac{1}{x^2} \quad \text{dan} \quad Y = y$	1 1	
	(b)	Kecerunan / <i>Gradient</i> = 2 Pintasan-Y / <i>Y-intercept</i> = 3	1 1	4
10	(a)	$P\left(\frac{\mu - \sigma - \mu}{\sigma} < Z < \frac{\mu + \sigma - \mu}{\sigma}\right)$ $= P(-1 < Z < 1)$ $= 1 - 2P(Z \geq 1) \quad \text{dan / and} \quad = 1 - 2(0.1587)$ $= 0.6826$ $m = 68.26$	1 1	
	(b)	$P\left(\frac{47-55}{8} < Z < \frac{63-55}{8}\right)$ $= P(-1 < Z < 1)$ $= 0.6826$	1	
	(c)	0.6826×500 341	1 1	5
11		$f'(x) = \frac{(1-2x)(2) - (2x)(-2)}{(1-2x)^2}$ $= \frac{2}{(1-2x)^2}$ $\int_1^2 -\frac{3}{(1-2x)^2} dx = -\frac{3}{2} \int_1^2 \frac{2}{(1-2x)^2} dx$	1 1	

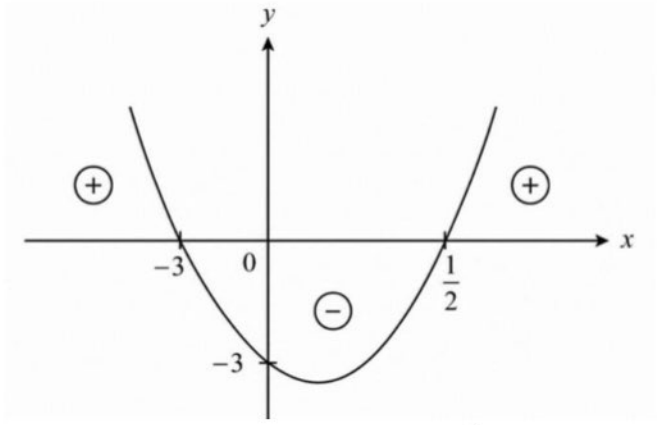
		$= -\frac{3}{2} \left[\frac{2x}{1-2x} \right]_1^2$ $= -\frac{3}{2} \left[\frac{2(2)}{1-2(2)} - \frac{2(1)}{1-2(1)} \right]$ $= -1$	1 1	4
12	(a)	titik tengah / <i>midpoint</i> $AD = \left(\frac{1+5}{2}, \frac{5+(-1)}{2} \right)$ $= (3, 2)$ $\overrightarrow{OB} = 3\underline{i} + 2\underline{j}$ $\overrightarrow{BC} = \overrightarrow{BO} + \overrightarrow{OA} + \overrightarrow{AC}$ $= -3\underline{i} - 2\underline{j} + (\underline{i} + 5\underline{i}) + (9\underline{i} + 3\underline{j}) \text{ atau setara/ or equivalent}$ $= 7\underline{i} + 6\underline{j}$	1 1	4
	(b)	$ \overrightarrow{BC} = \sqrt{7^2 + 6^2} = \sqrt{85}$ $\widehat{BC} = \frac{7\underline{i} + 6\underline{j}}{\sqrt{85}}$ $= \frac{7}{\sqrt{85}}\underline{i} + \frac{6}{\sqrt{85}}\underline{j} \text{ atau / or } = \frac{7\sqrt{85}}{85}\underline{i} + \frac{6\sqrt{85}}{85}\underline{j}$	1 1	
13	(a)	$A(0, 3)$	1	8
	(b) (i)	$y = \frac{1}{2}x + 3$ *dilihat / <i>seen</i> $m = \frac{1}{2}$ $\frac{1}{2}m_1 = -1 \text{ atau setara / or equivalent, } \quad *dilihat / \textit{seen}$ $y - 6 = -2(x - 6)$ $y = -2x + 18$ $\div 18: \frac{y}{18} = -\frac{2x}{18} + \frac{18}{18}$ $\frac{x}{9} + \frac{y}{18} = 1$	1 1 1 1	
	(ii)	$1 = -2(6) + 18$ $1 \neq 6$ dan / <i>and</i> Tidak / <i>No</i> .	1	
	(c)	$BC : BD = 2 : 5$ $\frac{5(7) + 2(x)}{2 + 5} = 6 \text{ atau / or } \frac{5(4) + 2(y)}{2 + 5} = 6 \text{ atau/ or setara/ equivalent}$ $D\left(\frac{7}{2}, 11\right)$	1 1	
14	(a) (i)	$T_9 = 25000(0.92)^{9-1}$ $= \text{RM}12830.47$	1 1	

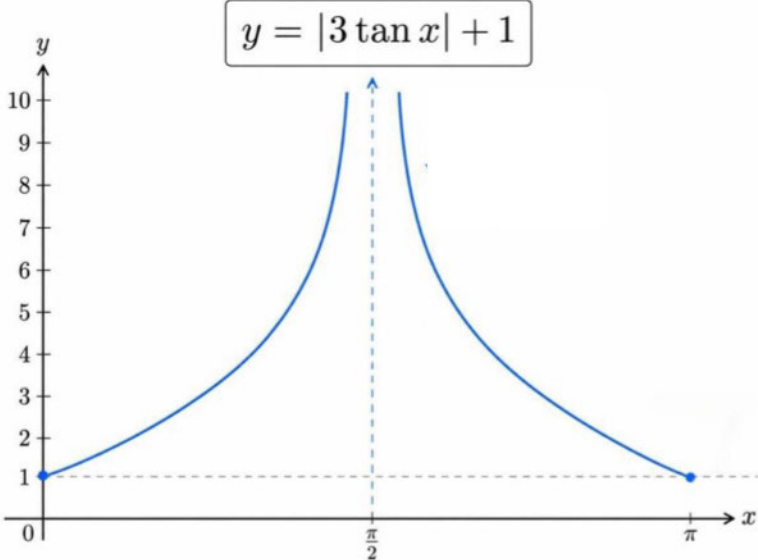
		(ii) $25000 - 12830.47$ $= \text{RM}12169.53$	1 1	
	(b)	$T_5 = 324$ $(4)(r)^{5-1} = 324$ $r = 3$ $\frac{4(3^n - 1)}{3 - 1} = 13120$ $3^n = 6561$ $= 3^8$ $n = 8$	1 1 1 1	8
15	(a)	(i) $\sin \lambda = \frac{1}{\sqrt{1+p^2}}$ atau / or $\cos \lambda = \frac{p}{\sqrt{1+p^2}}$ $\text{kosek } (180^\circ + \lambda) = -\frac{1}{\sin \lambda}$ $\text{cosec } (180^\circ + \lambda) = -\frac{1}{\sin \lambda}$ @ $\text{kosek } (180^\circ + \lambda) = \frac{1}{\sin 180^\circ \cos \lambda + \cos 180^\circ \sin \lambda}$ $\text{cosec } (180^\circ + \lambda) = \frac{1}{\sin 180^\circ \cos \lambda + \cos 180^\circ \sin \lambda}$ $-\sqrt{1+p^2}$	1 1 1	
		(ii) $\text{sek } (360^\circ - \lambda) = \frac{1}{\cos \lambda}$ $\sec (360^\circ - \lambda) = \frac{1}{\cos \lambda}$ @ $\text{sek } (360^\circ - \lambda) = \frac{1}{\cos 360^\circ \cos \lambda + \sin 360^\circ \sin \lambda}$ $\sec (360^\circ - \lambda) = \frac{1}{\cos 360^\circ \cos \lambda + \sin 360^\circ \sin \lambda}$ $\frac{\sqrt{1+p^2}}{p}$	1 1	
	(b)	$\cos \theta - \cos \theta (1 - \cos^2 \theta) = 0$ @ $\cos \theta (1 - \sin^2 \theta) = 0$ $\cos \theta = 0$ $\theta = 90^\circ$ @ $\frac{\pi}{2}$ $\theta = -\frac{\pi}{2}$ dan/and $\frac{\pi}{2}$	1 1 1	8

KERTAS 2 / PAPER 2:

[illegible]

		Ganti / <i>Substitute</i> (3) ke dalam / <i>into</i> (2): $0.05x + 0.04y + 0.02(3x + 3y - 80\,000) = 5\,850$ $0.11x + 0.10y = 7\,450 \text{ -----(5)}$ Ganti / <i>Substitute</i> (4) ke dalam / <i>into</i> (5): $0.11x + 0.10(70\,000 - x) = 7\,450$ $x = 45\,000$ $y = 25\,000$ $z = 130\,000$	1 1 1 1	7
3	(a)	Jarak yang dilalui oleh lengan robotik: <i>Distance travelled by robotic arm:</i> $S_{10} = \frac{10}{2} [2(120) + (10 - 1)(-5)]$ $= 5(240 - 45)$ $= 975 \text{ cm}$ $= 9.75 \text{ m}$ Jarak yang dilalui oleh bungkus: <i>Distance travelled by package:</i> $S_{10} = \frac{10}{2} [2(50) + (9)(-2)]$ $= 5(100 - 18)$ $= 4.10$ Beza / <i>Difference</i> = $9.75 - 4.10$ $= 5.65 \text{ m}$ 10-5.65 atau / <i>or</i> $(10 + 4.10) - 9.75$ $= 4.35 \text{ m}$	1 1 1 1	
	(b)	Jarak dari bungkus ke stesen pemprosesan = 494 cm <i>Distance for the package to the processing station = 494 cm</i> $\frac{n}{2} [2(50) + (n - 1)(-2)] = 494$ $\frac{n}{2} (102 - 2n) = 494$ $n^2 - 51n + 494 = 0$ $n = \frac{-(-51) \pm \sqrt{(-51)^2 - 4(1)(494)}}{2(1)}$ @ $(n - 13)(n - 38) = 0$ $n = 13, 38$	1 1	

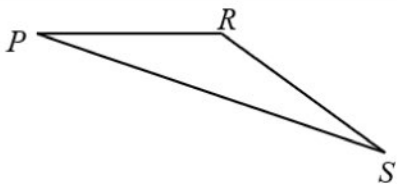
		Jumlah masa yang diambil oleh lengan robot hingga berhenti / <i>The total time taken by the robotic arm until it stops</i> $a = 120, d = -5$ $120 + (n - 1)(-5) = 0$ $n = 25$ (38 > 25, maka / so 38 ditolak / <i>rejected</i>) Jarak yang dilalui oleh robot dalam masa 13 saat <i>Distance travelled by the robot in 13 seconds</i> $= \frac{13}{2}[2(120) + (13 - 1)(-5)]$ $= 1170$ Oleh kerana $1170 < 1494$, lengan robotik tidak berjaya mencapai bungkusan tersebut sebelum ia memasuki stesen pemprosesan <i>Since $1170 < 1494$, the robotic arm does not successfully reach the package before it enters the processing station.</i>	1	1	8
4	(a)	$(2x - 1)(x + 3) \geq 0$ $x = \frac{1}{2}$ atau /or $x = -3$  $x \leq -3$ atau /or $x \geq \frac{1}{2}$	1	1	
	(b) (i)	$f(x) = 2x^2 - 4mx + m + 6$ $x = 2$ $2(2)^2 - 4m(2) + m + 6 = 0$ $m = 2$	1	1	
	(ii)	$2x^2 - 4mx + m + 6 = 3$ $2x^2 - 4mx + m + 3 = 0$ $(-4m)^2 - 4(2)(m + 3) = 0$ $16m^2 - 8m - 24 = 0$ $2m^2 - m - 3 = 0$ $(2m - 3)(m + 1) = 0$ $m = \frac{3}{2}, -1$	1	1	6

5	(a)	$7 = 10 \times \angle SWT$ $\angle SWT = \frac{7}{10} = 0.7$ $25^\circ = \frac{25(3.142)}{180} = 0.4364 \text{ rad}$ $\theta = 0.7 + 0.4364$ $= 1.136$	1 1 1	
	(b)	$A = \frac{1}{2}(8)^2(1.136)$ $A = 36.35$	1 1	
	(c)	Luas sektor SWT / <i>Area of sector SWT</i> $= \frac{1}{2}(10)^2(0.7)$ $63.88 = 36.35 + \frac{1}{2}(10)^2(0.7) - \text{luas kawasan berlerek} /$ <i>area of shaded region</i> Luas kawasan berlerek / <i>Area of shaded region</i> $= 7.47$	1 1 1	8
6	(a)	$\frac{-\sin \theta(1-\cos \theta)}{1-\cos ^2 \theta} \text { atau / or } \frac{-\sin \theta(1-\cos \theta)}{1-\cos ^2 \theta}$ $= \frac{\cos \theta-1}{\sin \theta} \text { atau / or } \frac{\cos \theta-1}{\sin \theta}$ $= \frac{\cos \theta}{\sin \theta}-\frac{1}{\sin \theta} \text { atau / or } \frac{\cos \theta}{\sin \theta}-\frac{1}{\sin \theta}$ $= \cot \theta-\operatorname{cosec} \theta \text { atau / or } \cot \theta-\operatorname{cosec} \theta$	1 1	
	(b) (i)	 -Graf tangen dengan adanya asimptot / <i>Tangent graph with asymptote</i> -Satu kitaran dalam julat $0 \leq x < \pi$ / <i>One cycle in the range $0 \leq x < \pi$</i> -Mutlak / <i>Modulus</i> -Nilai minimum =1 / <i>Minimum value = 1</i>	1 1 1 1	
	(ii)	$t \geq 1$	1	7

7	(a)	$\frac{dy}{dx} = 3x^2 - 2nx - 4$ $3(1)^2 - 2n(1) - 4 = 3$ $n = -2$	1 1	
	(b)	$x = 1, y = (1)^3 - (-2)(1)^2 - 4(1) + 3 \text{ atau / or } 3m_2 = -1$ $y = 2 \qquad \qquad \qquad m_2 = -\frac{1}{3}$ Ganti (1, 2) dalam $y = mx + c$ atau $y - y_1 = m(x - x_1)$ Substitute (1, 2) into $y = mx + c$ or $y - y_1 = m(x - x_1)$ $2 = -\frac{1}{3}(1) + c \qquad \qquad y - (2) = -\frac{1}{3}(x - 1)$ $\frac{7}{3} = c \qquad \qquad 3y - 6 = -x + 1$ $y = -\frac{1}{3}x + \frac{7}{3} \text{ atau / or } 3y + x = 7$	1 1 1	
	(c)	$\frac{dy}{dx} = 0, \quad 3x^2 + 2(2)x - 4 = 0$ $3x^2 + 4x - 4 = 0$ $(3x - 2)(x + 2) = 0$ $x = \frac{2}{3}, \quad x = -2$	1 1	7
8	(a)	(i) $M = \left(\frac{0+10}{2}, \frac{8+0}{2}\right) = (5, 4)$	1	
		(ii) $\frac{1}{2} [(10 \times 4) + (5 \times 0) + (0 \times (-4)) + (0 \times 0)] - [(5 \times 0) + (0 \times 4) + (0 \times 0) + (10 \times (-4))] $ 40	1 1	
	(b)	$\frac{2(x)+1(5)}{1+2} = 0 \text{ atau / or } \frac{2(y)+1(4)}{1+2} = -4$ $\left(-\frac{5}{2}, -8\right)$	1 1	
	(c)	(i) $\sqrt{(x-0)^2 + (y-8)^2} = 2 \sqrt{\left(x - \left(-\frac{5}{2}\right)\right)^2 + (y - (-8))^2}$ $3x^2 + 3y^2 + 20x + 80y + 217 = 0$	1 + 1 1	
		(ii) $y = 0$ $3x^2 + 20x + 217 = 0$ Pembazalayan / Discriminant: $(20)^2 - 4(3)(217) < 0$ Tidak, laluan penghantar tersebut tidak melintasi jalan utama (paksi-x). <i>No, the rider's path does not cross the main road (x-axis).</i>	 1 1	10

9	(a)	<table> <tr> <td>$\log_{10} x$</td> <td>0.08</td> <td>0.18</td> <td>0.30</td> <td>0.40</td> <td>0.50</td> <td>0.58</td> </tr> <tr> <td>$\log_{10} y$</td> <td>0.30</td> <td>0.54</td> <td>0.80</td> <td>0.96</td> <td>1.16</td> <td>1.30</td> </tr> </table>	$\log_{10} x$	0.08	0.18	0.30	0.40	0.50	0.58	$\log_{10} y$	0.30	0.54	0.80	0.96	1.16	1.30	1 1	
$\log_{10} x$	0.08	0.18	0.30	0.40	0.50	0.58												
$\log_{10} y$	0.30	0.54	0.80	0.96	1.16	1.30												
	(b)	Skala betul dan memplot satu titik dengan betul <i>Correct scale and plot 1 point correctly</i> Semua titik diplot dengan betul <i>Plot all the points correctly</i> Garis penyuaian terbaik <i>Line of best fit</i>	1 1 1															
	(c) (i)	$\log_{10} y = n \log_{10} x + \log_{10} k$ $n = \frac{0.96 - 0.54}{0.40 - 0.18}$ $n = 1.909$	1 1 1															
	(ii)	$\log_{10} k = 0.2$ $k = 1.585$	1 1	10														
10	(a)	$y = x^2 + 4$ $\frac{dy}{dx} = 2x$ $2x = p$ $x = \frac{p}{2}$ $px = x^2 + 4$ $p\left(\frac{p}{2}\right) = \left(\frac{p}{2}\right)^2 + 4$ $\frac{p^2}{2} = \frac{p^2}{4} + 4$	1 1															

		$\frac{p^2}{4} = 4$ $p^2 = 16$ $p = \pm 4$ $p > 0, \text{ maka / so } p = 4$	1	
	(b)	$x = \frac{4}{2} = 2$ $y = 4(2) = 8$ $A(2,8)$ Kaedah alternatif / <i>Alternative method</i> $A_1 = \int_0^2 (x^2 + 4) dx$ $= \left[\frac{x^3}{3} + 4x \right]_0^2$ $= \left[\frac{(2)^3}{3} + 4(2) \right] - \left[\frac{(0)^3}{3} + 4(0) \right]$ $= 10\frac{2}{3}$ $A_2 = \frac{1}{2}(2)(8)$ $= 8$ $A_1 - A_2$ $= 10\frac{2}{3} - 8$ $= 2\frac{2}{3}$ @ $A_1 = \int_4^8 (y - 4)^{\frac{1}{2}} dy$ $= \left[\frac{(y-4)^{\frac{3}{2}}}{\frac{3}{2}(1)} \right]_4^8$ $= \left[\frac{(8-4)^{\frac{3}{2}}}{\frac{3}{2}(1)} \right] - \left[\frac{(4-4)^{\frac{3}{2}}}{\frac{3}{2}(1)} \right]$ $= 5\frac{1}{3}$ $A_2 - A_1$ $= 8 - 5\frac{1}{3}$ $= 2\frac{2}{3}$	1 1 1 1	
	(c)	$\frac{1}{2}\pi \int_4^q (y - 4) dy = \frac{9}{4}\pi$ $\frac{1}{2}\pi \left[\frac{y^2}{2} - 4y \right]_4^q = \frac{9}{4}\pi$ $\frac{1}{2}\pi \left[\left(\frac{(q)^2}{2} - 4(q) \right) - \left(\frac{(4)^2}{2} - 4(4) \right) \right] = \frac{9}{4}\pi$ $\frac{q^2}{2} - 4q + 8 = \frac{9}{2}$ $\frac{q^2}{2} - 4q + \frac{7}{2} = 0$ $q^2 - 8q + 7 = 0$ $(q - 1)(q - 7) = 0$ $q = 1 \quad \text{atau} \quad q = 7$ $q > 4, q = 7$	1 1 1	10
11	(a) (i)	$P(X \geq 0.95)$ $= P\left(Z \geq \frac{0.95 - 0.75}{0.15}\right)$ $= P(Z \geq 1.333)$ $= 0.0913$	1 1	

		(ii) $P(X < m) = 0.28$ $P(Z < \frac{m-0.75}{0.15}) = 0.28$ $Z = -0.583$ $\frac{m-0.75}{0.15} = -0.583$ $m = 0.66255 // 0.6626$	1 1 1	
	(b)	(i) ${}^nC_1(0.25)^1(0.75)^{n-1} @ {}^nC_0(0.25)^0(0.75)^{n-0} @ {}^nC_n(0.75)^n(0.25)^0$ ${}^nC_1(0.25)^1(0.75)^{n-1} = 4 \times {}^nC_0(0.25)^0(0.75)^{n-0}$ atau setara / or equivalent $n(0.25)(0.75)^{n-1} = 4(0.75)^n$ $\frac{n(0.25)}{0.75} = 4$ $n = 12$	1 1 1	
		(ii) $\sigma = \sqrt{12(0.75)(0.25)}$ $= 1.5$	1 1	10
12	(a)	(i) $29.1 = \frac{1}{2}(15)(RS) \sin 104^\circ$ $RS = 3.999$	1 1	10
		(ii) $\cos / \cos 64.04^\circ = \frac{8}{PR}$ $PR = 18.28$ $PS^2 = 18.28^2 + 3.999^2 - 2(18.28)(3.999) \cos / \cos 35^\circ$ $PS = 15.18$	1 1 1	
		(iii) $\frac{\sin \angle RPS}{3.999} = \frac{\sin 35^\circ}{15.18}$ $\angle RPS = 8.691^\circ$	1 1	
	(b)	(i) 	1	
		(ii) $\angle R'SP = 180^\circ - 8.691^\circ - 145^\circ = 26.31^\circ$ $\frac{PR'}{\sin 26.31^\circ} = \frac{15.18}{\sin 145^\circ}$ $PR' = 11.73$	1 1	
13	(a)	(i) $137 = \frac{18.50}{P_{2023}} \times 100$ $P_{2023} = \text{RM}13.50$	1 1	10
		(ii) Katakan harga bahan T pada tahun 2023 ialah x Let the price of material T in the year 2023 be x $125 = \frac{x+9}{x} \times 100$ $x = \text{RM } 36$ $P_{2025} = \text{RM}45$	1 1	

	(b)	$\frac{137(1)+90(1)+(m-2)(1)+2m(1)+125(1)}{1+1+1+1+1} = 127$ $m = 95$	1 1	
	(c)	Kaedah alternatif / <i>Alternative method</i> $I_{2026/2025} = \frac{100 \times 134}{127} \qquad 134 = \frac{125}{P_{2023}} \times 100$ $= 105.51 \qquad P_{2023} = \text{RM } 98.43$ $105.51 = \frac{P_{2026}}{125} \times 100 \qquad 134 = \frac{P_{2026}}{98.34} \times 100$ $P_{2026} = \text{RM } 131.89 \qquad P_{2026} = \text{RM } 131.90$	1 1 1 1	10
14	(a)	$v_P = 4 + 3t - t^2$ $a = \frac{dv}{dt} = 3 - 2t$ halaju maksimum / <i>maximum velocity</i>, $\frac{dv}{dt} = 0$ $3 - 2t = 0$ $t = \frac{3}{2}$ $v_P = 4 + 3\left(\frac{3}{2}\right) - \left(\frac{3}{2}\right)^2$ $= 6.25 \text{ ms}^{-1}$	1 1 1	
	(b)	$v = 0,$ $4 + 3t - t^2 = 0 \quad \text{atau / or} \quad t^2 - 3t - 4 = 0$ $(4 - t)(1 + t) = 0 \qquad (t - 4)(t + 1) = 0$ $t = 4, \quad t = -1 \text{ (ditolak / rejected)}$ $t = 4$ $s = \int [4 + 3t - t^2] dt$ $= 4t + \frac{3t^2}{2} - \frac{t^3}{3} + c$ Apabila / <i>When</i> $t = 0, s = 0, c = 0$ $s = 4t + \frac{3t^2}{2} - \frac{t^3}{3}$ $s = 4(4) + \frac{3(4)^2}{2} - \frac{(4)^3}{3}$ $= 18.67 \text{ m}$	1 1 1 1	
	(c)	$s_Q = 4(-2) = -8$ Kedudukan Q / <i>Position of</i> $Q = 28 - 8$ $= 20$ Jarak / <i>Distance</i> $= 20 - 18.67$ $= 1.33$	1 1 1	10

15	(a)	$x + y \leq 180$ $y \geq \frac{1}{2}x$ $6x + 9y \geq 540$	1 1 1	
	(b)	• Lukis dengan betul sekurang-kurangnya satu garis lurus dari ketaksamaan yang melibatkan x dan y. <i>Draw at least one straight line correctly from the inequality involving x and y.</i> • Lukis semua garis lurus dengan betul dari semua ketaksamaan yang melibatkan x dan y. <i>Draw all the straight lines correctly from all the inequalities involving x and y.</i> • Rantau dilorek dengan betul. <i>The region is shaded correctly.</i>	1 1 1	
	(c) (i)	36	1	
	(ii)	$P = 6x + 9y$ $(0, 180)$ $P = 6(0) + 9(180)$ $= 1620$	1 1 1	10