

JAWAPAN DAN ULASAN

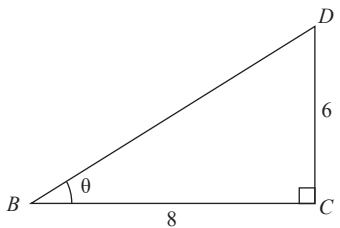
MATEMATIK TAMBAHAN

Dwibahasa

Bab 1 SUKATAN MEMBULAT

Kertas 1

Bahagian A

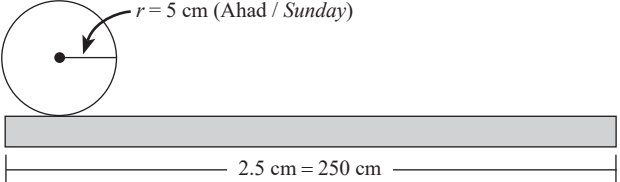
No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks	
1	(a) $\frac{120\pi}{180} = \frac{2}{3}\pi$	1		
	(b) $\angle AOB = \frac{60(3.142)}{180}$ $= 1.047 \text{ rad}$ $h + h + 1.047h = 15.235$ $3.047h = 15.235$ $h = 5$ $\frac{1}{2}(5)^2(1.047) - \frac{1}{2}(k)^2(1.047) = 8.376$ $k^2 = 9$ $k = 3, k = -3$ (abai / ignore) $k = 3$	2 1 2 1		
2	$\angle AOB \text{ major} = 2\pi - \frac{\pi}{3}$ $= \frac{5}{3}\pi$ Luas / Area = $\frac{1}{2}(2)^2 \left(\frac{5}{3}\pi\right)$ $= \frac{10}{3}\pi \text{ cm}^2$	1 1		2
	3	(a)  $\tan \theta = \frac{6}{8}$ $\theta = \tan^{-1}\left(\frac{6}{8}\right)$ $\theta = 0.6435 \text{ radian}$		

No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks
	<p>(b) $BD = \sqrt{6^2 + 8^2} = 10 \text{ cm}$ $\angle ABH = \frac{\pi}{3} \text{ rad}$ $\angle HBD = \pi - \frac{\pi}{3} - 0.6435 = 1.451 \text{ rad}$ $\angle GAH = \frac{\pi}{2} - \frac{\pi}{3} = \frac{\pi}{6} \text{ rad}$ $EF = \sqrt{12^2 + 18^2} = 21.63 \text{ cm}$ $S_{GH} = 10\left(\frac{\pi}{6}\right) = \frac{5\pi}{3} \text{ cm}$ $S_{HD} = 10(1.451) = 14.51$ Perimeter = $10 + \frac{5\pi}{3} + 14.51 + 2 + 21.63$ = 53.38 cm</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>6</p>

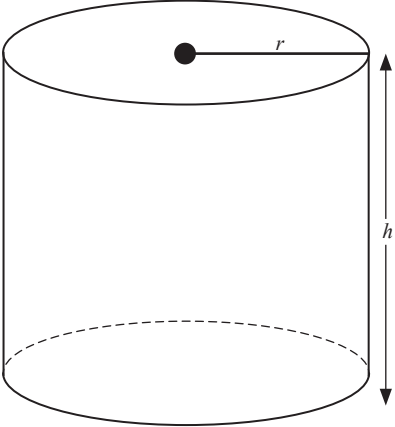
Kertas 2

Bahagian A

No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks
1	<p>$AB = 2 \times \text{Panjang lengkok} / \text{Length of the arc } PQ:$ $y = 2\left(\frac{3}{2} \pi x\right)$ $y = 3\pi x \dots \textcircled{1}$</p> <p>Luas kawasan tak berumput / Area of the non-grass region:</p> $6xy - \frac{1}{4} (3x)^2 (\pi) = (90x + 27)\pi \dots \textcircled{2}$ Ganti / Substitute $\textcircled{1}$ ke dalam / into $\textcircled{2}$: $6x(3\pi x) - \frac{1}{4} (3x)^2 (\pi) = (90x + 27)\pi \dots \textcircled{3}$ $\textcircled{3} \times \frac{1}{\pi}:$ $18x^2 - \frac{9x^2}{4} = 90x + 27$ $21x^2 - 120x - 36 = 0$ $7x^2 - 40x - 12 = 0$ $(x - 6)(7x + 2) = 0$ $x = 6, x = -\frac{2}{7}$ (Abai / Ignore) <p>Ganti / Substitute $x = 6$ ke dalam / into $\textcircled{1}$:</p> $y = 3\pi(6)$ = 18 π atau / or 56.55	<p>2</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>7</p>

No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks
2	<p>(a) $\frac{dV}{dt} = \frac{-5.5}{60} \text{ cm}^3 \text{ s}^{-1}$ $V = x^3$ $\frac{dV}{dx} = 3x^2$</p> <p>Bila / When $x = 15$, $\frac{dV}{dx} = 3(15)^2$ $= 675$</p> $\frac{dx}{dt} = \frac{dx}{dV} \times \frac{dV}{dt}$ $= \frac{1}{dV} \times \frac{dV}{dt}$ $= \frac{1}{675} \times \frac{-5.5}{60}$ $= \frac{-11}{81\,000}$	<p>1</p> <p>1</p> <p>1</p>	<p>3</p>
3	<p>(a) </p> <p>Isi padu / Volume $_{\text{sfera}} = \frac{4}{3}\pi r^3$, $\delta v = 20\pi \text{ cm}^3$</p> $\frac{dv}{dr} = \left(\frac{4}{3}\right)(3)\pi r^2$ $= 4\pi r^2$ <p>Apabila / When $r = 5 \text{ cm}$, $4\pi(5)^2 = 100\pi$</p> $\frac{\delta r}{\delta v} \approx \frac{dr}{dv}$ $\frac{\delta r}{-20\pi} \approx \frac{1}{100\pi}$ $\delta r \approx -0.2$ $r_{\text{baru/new}} = r_{\text{jama/old}} + \delta r$ $= 5 \text{ cm} + (-0.2)$ $= 4.8 \text{ cm}$ $d_{\text{baru/new}} = 2(4.8 \text{ cm})$ $= 9.6 \text{ cm}$ <p>Bilangan bola / Number of balls $\approx \frac{250 \text{ cm}}{9.6 \text{ cm}}$ ≈ 26.04 ≈ 26 biji bola / balls</p> <p>(b) $h(x) = 3x^2 + 7x - 8$ $h'(x) = 6x + 7$ $h''(x) = 6 > 0$</p> <p>$\therefore h''(x) > 0$, titik pusingan minimum / minimum turning point.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>6</p>

Bahagian A

No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks
1	<p>(a)</p>  $I_{\text{silinder}} / V_{\text{cylinder}} = \frac{125}{4} \pi \text{ m}^3$ $\pi r^2 h = \frac{125}{4} \pi$ $r^2 h = \frac{125}{4}$ $h = \frac{125}{4r^2}$ <p>Jumlah luas permukaan, A Total surface area, A</p> $A = 2\pi r^2 + 2\pi r h$ $= 2\pi r^2 + 2\pi r \left(\frac{125}{4r^2} \right)$ $= 2\pi r^2 + \frac{125\pi}{2r}$	<p>1</p> <p>1</p> <p>1</p>	

Kertas 1

Bahagian A

No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks
1	(b) $\int [2g(x) + 3] dx$ $= \int 2g(x) dx + \int 3 dx$ $= 2\left(\frac{5}{1-x^2}\right) + 3x + c$	2 1	3
2	(c) $\frac{dy}{dx} = (2x + 1)^3$ $\int dy = \int (2x + 1)^3 dx$ $y = \frac{(2x + 1)^4}{(4)(2)} + c$ $y = \frac{1}{8}(2x + 1)^4 + c$, pada / at $\left(\frac{1}{2}, 5\right)$ $5 = \frac{1}{8}\left[2\left(\frac{1}{2}\right) + 1\right]^4 + c$ $5 = 2 + c$ $c = 3$ $\therefore y = \frac{1}{8}(2x + 1)^4 + 3$	1 1 1	3
3	(a) $g(x) = -3x^2 + 8x - 4$ (b) Kawasan berlerek / Shaded area $= \int_1^2 (x^3 - 6x^2 + 12x - 6) dx - [-x^3 + 4x^2 - 4x]_1^2$ $= \left[\frac{x^4}{4} - \frac{6x^3}{3} + \frac{12x^2}{2} - 6x + x^3 - 4x^2 + 4x \right]_1^2$ $= \left[\frac{x^4}{4} - x^3 + 2x^2 - 2x \right]_1^2$ $= \left[\frac{2^4}{4} - 2^3 + 2(2)^2 - 2(2) \right] - \left[\frac{1}{4} - 1^3 + 2(1)^2 - 2(1) \right]$ $= \left(\frac{16}{4} - 8 + 8 - 4 \right) - \left(\frac{1}{4} - 1 + 2 - 2 \right)$ $= 0 - \left(-\frac{3}{4} \right)$ $= \frac{3}{4} \text{ unit}^2$	1 2 1 1	5

Bahagian A

No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks
1	(a) $\frac{dy}{dx} = 2x - 2$ $y = \int(2x - 2) dx$ $= \frac{2x^2}{2} - 2x + c$ $x = -2, y = -7$ $-7 = (-2)^2 - 2(-2) + c$ $c = -15$ $y = x^2 - 2x - 15$	1	7
	(b) $y = (x + 1)^2 - 2(x + 1) - 15$ $y = x^2 + 2x + 1 - 2x - 2 - 15$ $y = x^2 - 16$ $x^2 = y + 16$ $V = \pi \int_{-16}^0 (y + 16) dy$ $= \pi \left[\frac{y^2}{2} + 16y \right]_{-16}^0$ $= \pi \left[\frac{0^2}{2} + 16(0) \right] - \pi \left[\frac{(-16)^2}{2} + 16(-16) \right]$ $= 128\pi$	1 1 1	
2	(a) (i) $\frac{dy}{dx} : 6 - 2x = 0$ $x = 3$ $EH = 3 - p + 2p$ $= 3 + p$	1 1	
	(ii) $\int \frac{dy}{dx} = \int 6 - 2x$ $y = 6x - x^2 + c \dots \textcircled{1}$ Ganti / Substitute (0, 0) ke dalam / into $\textcircled{1}$ $0 = 6(0) - 0^2 + c$ $c = 0$ $y = 6x - x^2 \dots \textcircled{2}$ Ganti / Substitute $x = 3 + p$ ke dalam / into $\textcircled{2}$ $y = 6(3 + p) - (3 + p)^2$ $= 9 - p^2$ Luas / Area, $L = (9 - p^2 - 1)(2p)$ $= 16p - 2p^3$	1 1 1 1	

No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks
	<p>(c) Dari / From ②, $y = 2x - 10$ apabila / when $x = 0$ $y = 2(0) - 10$ $y = -10$</p> <p>$y = 2x - 10$ apabila / when $y = 0$ $0 = 2x - 10$ $-2x = -10$ $x = 5$</p> <p>Isi padu kon / <i>Volume of cone</i> $= \frac{1}{3}\pi r^2 h$ $= \frac{1}{3}\pi(5)^2(10)$ $= 83\frac{1}{3}\pi \text{ unit}^3$</p> <p>Dari / From ①, $y = x^2 - 9$ apabila / when $x = 0$ $y = (0)^2 - 9$ $y = -9$</p> <p>Luas lengkung / <i>Volume of the curve</i> $= \pi \int_{-9}^0 x^2 dy = \pi \int_{-9}^0 (y + 9) dy$ $= \pi \left[\frac{1}{2}y^2 + 9y \right]_{-9}^0$ $= \pi \left[\frac{1}{2}(0)^2 + 9(0) \right] - \pi \left[\frac{1}{2}(-9)^2 + 9(-9) \right]$ $= 0 - \left(-\frac{81}{2}\pi \right)$ $= 40\frac{1}{2}\pi \text{ unit}^3$</p> <p>$I_{\text{lorekan dikisar } 180^\circ} = \frac{1}{2}(\text{Isi padu kon} - \text{Isi padu lengkung})$ $V_{\text{shaded revolved } 180^\circ} = \frac{1}{2}(\text{Volume of cone} - \text{Volume of curve})$ $= \frac{1}{2} \left(83\frac{1}{3}\pi - 40\frac{1}{2}\pi \right)$ $= \frac{1}{2} \left(42\frac{5}{6}\pi \right) \text{ unit}^3$ $= 21\frac{5}{12}\pi \text{ unit}^3$</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>10</p>

No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks
4	(a) $\frac{dy}{dx} = \frac{1}{2} (x+9)^{-\frac{1}{2}}(1)$ $= \frac{1}{2} (-5+9)^{-\frac{1}{2}}$ $= \frac{1}{4}$	1 1	
	(b) $h = \sqrt{-5+9}$ $= \pm 2$ $\therefore h = 2$ $\int_{-9}^{-5} (x+9)^{\frac{1}{2}} = \left[\frac{2}{3} (x+9)^{\frac{3}{2}} \right]_{-9}^{-5}$ $= \frac{2}{3} (-5+9)^{\frac{3}{2}} - \frac{2}{3} (-9+9)^{\frac{3}{2}}$ $= \frac{16}{3}$ Luas kawasan berlorek / Shaded area region $= \frac{1}{2} \left(2 + \frac{3}{2} \right) (5) + \frac{16}{3}$ $= 14.08$	1 1 2 1	
	(c) $\pi \int_0^2 (y^2 - 9)^2 dy$ $= \pi \int_0^2 y^4 - 18y^2 + 81 dy$ $= \pi \left[\frac{y^5}{5} - \frac{18y^3}{3} + 81y \right]_0^2$ $= \pi \left[\frac{y^5}{5} - 6y^3 + 81y \right]_0^2$ $= \pi \left[\frac{(2)^5}{5} - 6(2)^3 + 81(2) \right] - \pi \left[\frac{(0)^5}{5} - 6(0)^3 + 81(0) \right]$ $= 120.4\pi$	1 1 1	

10

Bab 4 PILIH ATUR DAN GABUNGAN

Kertas 1

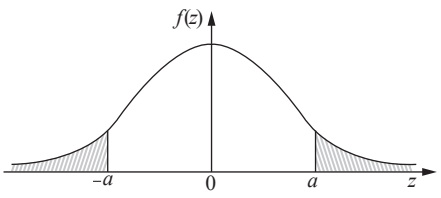
Bahagian A

No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks
1	(a) (i) $6! = 720$ (ii) $\frac{1 \text{ kad / card}}{3 \text{ kad / cards}}$ atau / or $\frac{2 \text{ kad / cards}}{2 \text{ kad / cards}}$ $\frac{1 \text{ kad / card}}{3 \text{ kad / cards}} = 4 \times 2! \times 2! \times 3$ $= 48 \text{ cara / ways}$ $\frac{2 \text{ kad / cards}}{2 \text{ kad / cards}}$ $\therefore \frac{15 \text{ atau / or } 17 \text{ atau / or } 19}{26 \text{ atau / or } 62} = 6 \text{ cara / ways}$ $\therefore \frac{51 \text{ atau / or } 57 \text{ atau / or } 59}{62} = 3 \text{ cara / ways}$	1	

Kertas 1

Bahagian A

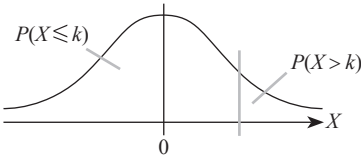
No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks
1	(a) Benar. Saiz kasut boleh dibilang. <i>True. Shoe sizes can be counted.</i>	1	5
	(b) (i) $P(X \leq 1) = 11P(X = 0)$ ${}^n C_0 (p^0)(q^n) + {}^n C_1 (p^1)(q^{n-1}) = 11 {}^n C_0 (p^0)(q^n)$ $q^n + npq^{n-1} = 11q^n$ $npq^{n-1} = 10q^n$ $\frac{npq^n}{q} = 10q^n$ Banding / Compare, $\frac{np}{q} = 10$ $n(1 - q) = 10q$	1	
	(ii) $n(1 - q) = 10q$ $np = 10q$ $6 = 10q$	1	
	$q = \frac{2}{5}, p = \frac{2}{5}$	1	
2	(a) $P(X = 2) + P(X = 3) = 1 - \frac{81}{128} - \frac{1}{64}$ $= \frac{45}{128}$	1	4
	(b) ${}^5 C_2 (p)^2 (q)^3 + {}^5 C_3 (p)^3 (q)^2 = \frac{45}{128}$ $10p^2 q^3 + 10p^3 q^2 = \frac{45}{128}$ $10p^2 q^2 (q + p) = \frac{45}{128}$ $p^2 q^2 (q + p) = \frac{9}{256}$ $p^2 q^2 (1) = \frac{9}{256}$ $pq = \frac{3}{16}$ $p = \frac{3}{16q}$	1	
	Tertunjuk / Shown	1	
3	(a) Katakan X = peristiwa di mana produk boleh dijual <i>Let X = event that a product can be sold</i> $n = 820, p = \frac{19}{20}, q = \frac{1}{20}$ Min / Mean = $(820) \left(\frac{19}{20} \right)$ $= 779$	1	

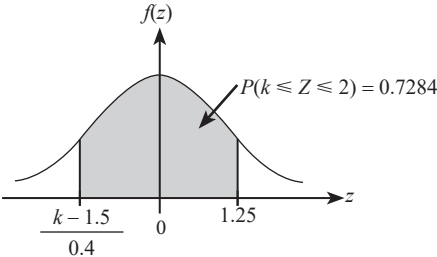
No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks
	Sisihan piawai / Standard deviation, $= \sqrt{(820)\left(\frac{19}{20}\right)\left(\frac{1}{20}\right)}$ $= \sqrt{\left(\frac{779}{20}\right)}$ $= 6.241$	1 1	3
4	(a) 	1	3
	(b) (i) $k = 0.431$ (ii) Mod bahagian A / Mode for part A $k = -0.431$	1 1	
5	(a) $X \sim N(20, 0.5^2)$ Min / Mean = 20 Varians / Variance = $(0.5)^2 = 0.25$	1	4
	(b) (i) $P(Z < m) = P(Z > k)$ $\frac{(-\alpha + 40) - 20}{0.5} = m$ $-\alpha + 40 - 20 = 0.5m$ $-\alpha + 20 = 0.5m$ $40 - 2\alpha = m$	1	
	(ii) $P(Z < k) = 0.2662$ $2[0.5 - P(Z > k)] = 0.2662$ $1 - 2P(Z > k) = 0.2662$ $2P(Z > k) = 0.7338$ $P(Z > k) = 0.3669$ $\frac{\alpha - 20}{0.5} = 0.34$ $\alpha - 20 = 0.17$ $\alpha = 20.17$	1	

Kertas 2

Bahagian B

No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks
1	(a) (i) $n = 5\,000, p = \frac{97}{1 + 97 + 2} = 0.97$ $\mu = np$ $= (5\,000)(0.97)$ $= 4\,850$ (ii) $p = 0.03, q = 0.97, n = 6, r = 2$ $P(X = 2) = {}^6C_2(0.03)^2(0.97)^4$ $= 0.01195$	1 1 1 1	

No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks
	<p>(iii) $n = 10, p = \frac{1}{3}, q = \frac{2}{3}, r > 2$</p> $P(X > 2) = 1 - P(X \leq 2)$ $= 1 - P(X = 0) - P(X = 1) - P(X = 2)$ $= 1 - {}^{10}C_0 \left(\frac{1}{3}\right)^0 \left(\frac{2}{3}\right)^{10} - {}^{10}C_1 \left(\frac{1}{3}\right)^1 \left(\frac{2}{3}\right)^9 - {}^{10}C_2 \left(\frac{1}{3}\right)^2 \left(\frac{2}{3}\right)^8$ $= 1 - 0.0173 - 0.0867 - 0.1951$ $= 0.7009$ <p>(b) $P(X > k) = \frac{1}{4} [P(X \leq k)]$</p>  $P(X \leq k) + P(X > k) = 1$ $4P(X > k) + P(X > k) = 1$ $P(X > k) = 0.2$ $\frac{k - 12}{\sqrt{25}} = 0.842$ $k = 16.21$	<p>1</p> <p>1</p> <p>1</p> <p>2</p> <p>1</p>	<p>10</p>
2	<p>(a) (i) ${}^8C_8(0.9772^8)(0.0228^0)$ $= 0.8315$</p> <p>(ii) $P(X \leq 6)$ $= 1 - {}^8C_8(0.9772^8)(0.0228^0) - {}^8C_7(0.9772^7)(0.0228^1)$ $= 0.0133$</p> <p>(b) $\frac{61 - 60}{\sigma} = 1.999$ $\sigma = 0.5$</p> $P(X < 60.5)$ $= P\left(Z < \frac{60.5 - 60}{0.5}\right)$ $= P(Z < 1)$ $= 1 - P(Z \geq 1)$ $= 0.8413$	<p>1</p> <p>1</p> <p>2</p> <p>1</p> <p>2</p> <p>1</p> <p>1</p> <p>1</p>	<p>10</p>
3	<p>(a) Katakan $X =$ Murid tidak menaiki bus <i>Let $X =$ Student not go by bus</i> $n = 8, q = 0.75, p = 1 - 0.75$ $= 0.25$</p> $P(x \leq 2) = P(X = 0) + P(X = 1) + P(X = 2)$ $= {}^8C_0(0.25)^0(0.75)^8 + {}^8C_1(0.25)^1(0.75)^7 + {}^8C_2(0.25)^2(0.75)^6$ $= 0.1001 + 0.2670 + 0.3115$ $= 0.6786$ <p>(b) (i) $X \sim N(1.5, 0.4^2)$</p> $P(X > 2) = P\left(Z > \frac{2 - 1.5}{0.4}\right)$ $= P(Z > 1.25)$ $= 0.1056$	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	

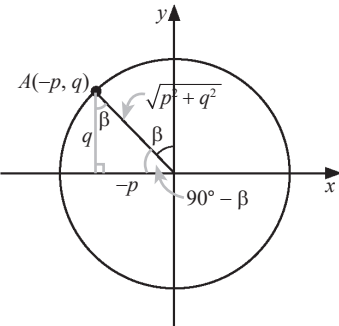
No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks
(ii)	 <p style="text-align: center;">$P(k \leq Z \leq 2) = 0.7284$</p> <p style="text-align: center;">$P(k \leq X \leq 2) = 72.84\%$</p> $P\left(\frac{k-1.5}{0.4} \leq Z \leq \frac{2-1.5}{0.4}\right) = 0.7284$ $P\left(\frac{k-1.5}{0.4} \leq Z \leq 1.25\right) = 0.7284$ $P\left(Z \geq \frac{k-1.5}{0.4}\right) - P(Z \geq 1.25) = 0.7284$ $P\left(Z \geq \frac{k-1.5}{0.4}\right) - 0.1056 = 0.7284$ $P\left(Z \geq \frac{k-1.5}{0.4}\right) = 0.8340$ $1 - P\left(Z < \frac{k-1.5}{0.4}\right) = 0.8340$ $P\left(Z < \frac{k-1.5}{0.4}\right) = 0.1660$ $\frac{k-1.5}{0.4} = -0.97$ $k - 1.5 = -0.388$ $k = 1.112$	1 1 1 1 1	10

Bab 6

FUNGSI TRIGONOMETRI

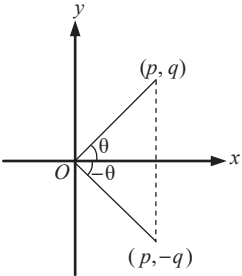
Kertas 1

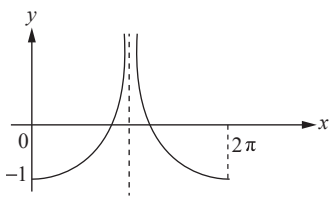
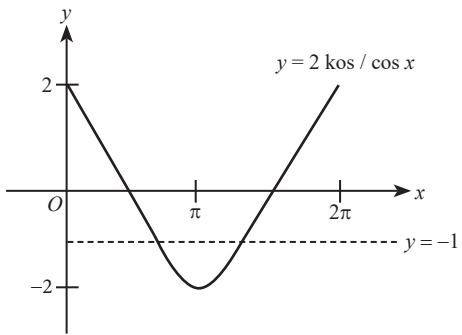
Bahagian A

No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks
1	 <p>(a) $\tan \beta = -\frac{p}{q}$</p>	1	

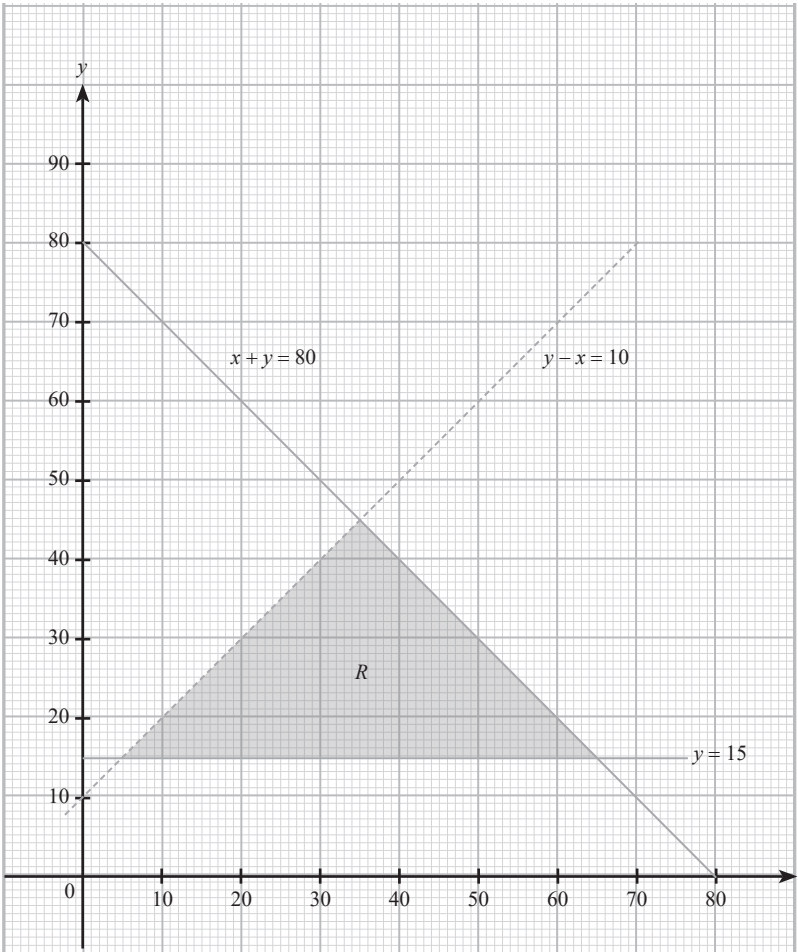
No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks
	(b) $\tan (180^\circ + \beta) = -\tan \beta$ $= -\left(-\frac{p}{q}\right)$ $= \frac{p}{q}$ (ii) $\text{kot} / \cot (180^\circ + \beta) = \frac{1}{\tan (180^\circ + \beta)}$ $= \frac{1}{\frac{p}{q}}$ $= \frac{p}{q}$	1	2

Bahagian B

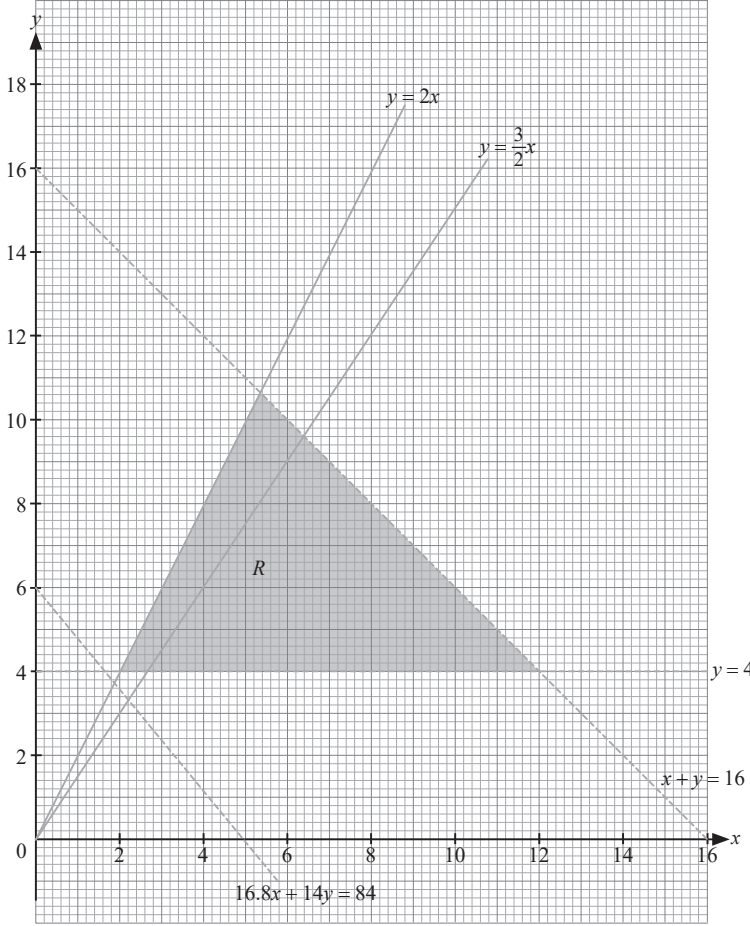
No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks
2	(a) (i)  (ii) $\tan (-\theta) = -\tan \theta$ $= -\frac{p}{q}$	1	
	(b) $2 \cos x = \sqrt{3} \cot x$ $2 \cos x = \sqrt{3} \frac{\cos x}{\sin x}$ $2 \cos x \sin x - \sqrt{3} \cos x = 0$ $\cos x (2 \sin x - \sqrt{3}) = 0$ $\cos x = 0,$ $\sin x = \frac{\sqrt{3}}{2}$ $x = 90^\circ, 270^\circ$ $x = 60^\circ, 120^\circ$ $x = 60^\circ, 90^\circ, 120^\circ, 270^\circ$	1	
	(c) $\tan m = \frac{p}{1}$ dalam sukuan 3 / in quadrant 3 $\cos m = -\frac{1}{\sqrt{1+p^2}}, \quad \sin m = -\frac{p}{\sqrt{1+p^2}}$ $\cos\left(\frac{\pi}{3} - m\right) = \cos \frac{\pi}{3} \cos m + \sin \frac{\pi}{3} \sin m$ $= \frac{1}{2} \cos m + \frac{\sqrt{3}}{2} \sin m$ $= -\frac{1}{2\sqrt{1+p^2}} - \frac{\sqrt{3}p}{2\sqrt{1+p^2}}$ $= \frac{-\sqrt{3}p - 1}{2\sqrt{1+p^2}}$	1	

No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks
	<p>(b) (i) </p> <p>(ii) $m < -1$</p>	<p>3</p> <p>1</p>	<p>6</p>
<p>3</p>	<p>(a) $c = -1$ Pada / At $(p, -2)$; $-2 = \tan p - 1$ $-1 = \tan p$ (II, IV)</p> <p>Sudut rujukan / Reference angle = $\tan^{-1}(1)$ $= 45^\circ$</p> <p>$\therefore p = 360^\circ - 45^\circ$ $p = 315^\circ$</p>	<p>1</p> <p>1</p>	
	<p>(b) (i) $2 \cos / \cos x = -1$; $\pi \leq x \leq 3\pi$</p> <p>$\cos / \cos x = -\frac{1}{2}$ (II, III)</p> <p>Sudut rujukan / Reference angle = $\cos / \cos^{-1}\left(\frac{1}{2}\right)$ $= 60^\circ$ $= \frac{\pi}{3}$</p> <p>$x = \pi - \frac{\pi}{3}, \pi + \frac{\pi}{3}, 3\pi - \frac{\pi}{3}$ $x = \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{8\pi}{3}$ $\therefore x = \frac{4\pi}{3}, \frac{8\pi}{3}$</p> <p>(ii) </p> <p>$\cos / \cos x < -\frac{1}{2}$ $2 \cos / \cos x < -1$ $y < -1$</p> <p>$\therefore \frac{2\pi}{3} \leq x \leq \frac{4\pi}{3}$</p>	<p>1</p> <p>1</p> <p>1</p> <p>2</p> <p>1</p>	<p>8</p>

Bahagian C

No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks
1	(a) I : $x + y \leq 80$ II : $y - x < 10$ III : $y \geq 15$	1 1 1	
	(b) 	3	
	(c) (i) 44 (ii) Titik maksimum / Maximum point = (36, 44) $a(36) + 4(36) + a(44) = 400$ $80a = 400 - 144$ $a = 3.2$ Baki bayaran murid kelas B The balance of payment by a student of class B = RM3.20	1 1 1 1	10

No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks				
2	(a) $x + y \leq 180$ $y - x < 60$ $y \geq \frac{1}{2}x$	1 1 1	10				
	(b)	3					
	(c) (i) 120 (ii) (21, 80) Untung maksimum / <i>Maximum profit</i> $= -5.5(21) + 40(80)$ $= \text{RM3 084.50}$	1 1 1 1					
3	(a) $p = 16$ $q = 4$	1					
	(b) $y \leq 2x$ <table border="1" data-bbox="234 1471 769 1550"> <tbody> <tr> <td>x</td> <td>0</td> <td>4</td> </tr> <tr> <td>y</td> <td>0</td> <td>8</td> </tr> </tbody> </table>	x		0	4	y	0
x	0	4					
y	0	8					

No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks																		
		2																			
	<p>(c) (i) Kaedah 1 = Kaedah algebra Method 1 = Algebraic method</p> <table border="1" data-bbox="278 1185 392 1342" style="display: inline-table; vertical-align: middle;"> <tr><td>y</td><td>:</td><td>x</td></tr> <tr><td>3</td><td>:</td><td>2</td></tr> <tr><td>6</td><td>:</td><td>4</td></tr> <tr><td>9</td><td>:</td><td>6</td></tr> </table> <div style="display: inline-block; vertical-align: middle; margin-left: 10px;"> <p>} Koordinat (4, 6) dan (6, 9) berada dalam rantau R. The coordinates (4, 6) and (6, 9) are in R region.</p> </div> <p style="margin-top: 20px;">Kaedah 2 = Kaedah graf Method 2 = Graphical method</p> $\frac{y}{x} = \frac{3}{2}$ $y = \frac{3}{2}x$ <table border="1" data-bbox="278 1617 506 1695" style="margin-top: 10px;"> <tr><td>x</td><td>0</td><td>6</td></tr> <tr><td>y</td><td>0</td><td>9</td></tr> </table> <p style="margin-top: 10px;">∴ Bilangan yang mungkin bagi anak patung Mal ialah 4 dan 6. Possible number of Mal's dolls are 4 and 6.</p>	y	:	x	3	:	2	6	:	4	9	:	6	x	0	6	y	0	9	1	
y	:	x																			
3	:	2																			
6	:	4																			
9	:	6																			
x	0	6																			
y	0	9																			

No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks						
	(ii) $k = 16.8x + 14y$	1							
	Katakan / Let $16.8x + 14y = 84$								
	<table border="1"> <tr> <td>x</td> <td>0</td> <td>5</td> </tr> <tr> <td>y</td> <td>6</td> <td>0</td> </tr> </table>	x		0	5	y	6	0	1
x	0	5							
y	6	0							
	Titik maksimum / Maximum point = (12, 4)	1							
	Kos maksimum / Maximum cost = $16.8(12) + 14(4)$ = RM257.60	1	10						

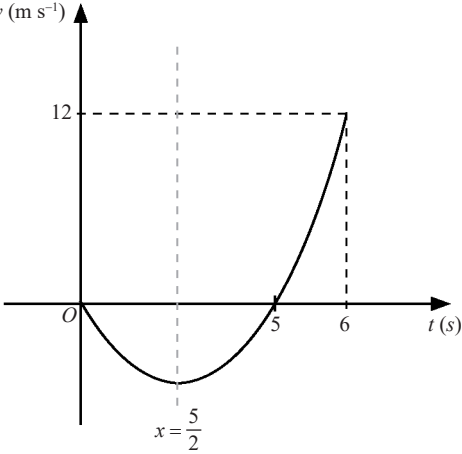
Bab 8

KINEMATIK GERAKAN LINEAR

Kertas 2

Bahagian C

No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks
1	(a) Zarah A / Particle A $V_0 = 3(0)^2 + 8(0) + 5$ = 5 m s^{-1}	1	
	Zarah B / Particle B $V_0 = 3(0)^2 - 2(0) + 4$ = 4 m s^{-1}	2	
	(b) $S_A = S_B$ $t^3 + 4t^2 + 5t = t^3 - t^2 + 4t + 18$ $5t^2 + t - 18 = 0$ $(5t - 9)(t + 2) = 0$	1	
	$t = \frac{9}{5}$ dan / and $t = -2$ (Abai / Ignore)	1	
	Jarak dilalui A ketika berlanggar / Distance travelled by A when colliding = $\left(\frac{9}{5}\right)^3 + 4\left(\frac{9}{5}\right)^2 + 5\left(\frac{9}{5}\right)$ = 27.79	1	
	Jarak dilalui B ketika berlanggar / Distance travelled by B when colliding = $27.79 - 18$ = 9.79	1	
	(c) $t = \frac{9}{5}$ $a_A = 6t + 8$ $6\left(\frac{9}{5}\right) + 8 = 18.8$	1	
	$a_B = 6t - 2$ $6\left(\frac{9}{5}\right) - 2 = 8.8$	1	
		1	
		10	

No	Skema Pemarkahan Marking Scheme	Markah Marks	Jumlah Markah Total Marks	
3	(a) (i) $t = 5 \text{ s}$ (ii) Bergerak ke kiri / Moves to left: $v < 0$ $0 < t < 5$	1		
		1		
	<p>(b) (i) $v \text{ (m s}^{-1}\text{)}$</p>  <p>$x = \frac{5}{2}$</p> <p>$v = at^2 + bt + c$ pada / at $(0, 0)$ $0 = a(0)^2 + b(0) + c$ $0 = c$</p> <p>$v = at^2 + bt + c$ pada / at $(5, 0)$ $0 = a(5)^2 + b(5) + c$ $0 = 25a + 5b$ $-25a = 5b$ $-5a = b \dots \textcircled{1}$</p> <p>$v = at^2 + bt + c$ pada / at $(6, 12)$ $12 = a(6)^2 + b(6)$ $12 = 36a + 6(-5a)$ $12 = 36a - 30a$ $12 = 6a$ $2 = a$</p> <p>Dari / From $\textcircled{1}$, $b = -5(2)$ $= -10$</p> <p>$\therefore v = 2t^2 - 10$ (Tertunjuk / Shown)</p> <p>(ii) $v = 2t^2 - 10$</p> <p>$a = \frac{dv}{dt}$ $a = 4t - 10$ apabila / when $t = 2 \text{ s}$ $a = 4(2) - 10$ $a = -2 \text{ m s}^{-2}$</p>			
1	1	1	1	1

