



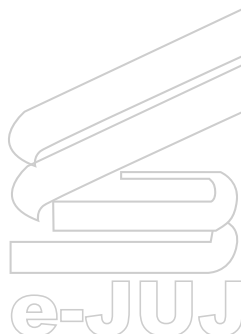
PRAKTIS BESTARI
PROJEK JAWAB UNTUK JAYA (JUJ) 2017

SIJIL PELAJARAN MALAYSIA
ADDITIONAL MATHEMATICS
Kertas 2/Set 2

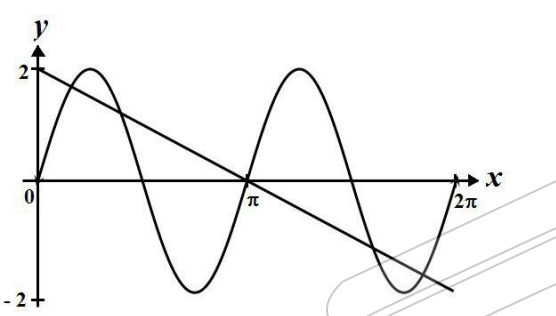
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PERATURAN PEMARKAHAN

Peraturan Pemarkahan ini mengandungi 11 halaman bercetak



NO	SOLUTION	SUB MARK	TOTAL MARK
1.	$y = 2 - 2x$ or $x = \frac{2-y}{2}$ Eliminate x or y $(2-2x)^2 + 2x^2 + 3x - 3 = 0$ or $y^2 + 2\left(\frac{2-y}{2}\right)^2 + 3\left(\frac{2-y}{2}\right) - 3 = 0$ $(3x-1)(2x-1) = 0$ or $(3y-4)(y-1) = 0$ $x = \frac{1}{3}$, $x = \frac{1}{2}$ or $y = \frac{4}{3}$, $y = 1$ $y = \frac{4}{3}$, $y = 1$ or $x = \frac{1}{3}$, $x = \frac{1}{2}$	1m 1m 1m 1m 1m	<hr/> 5 markah
2.	(a) $3x^2 + 9x - 2m + 1 = 0$ $\alpha + 2\alpha = -\frac{9}{3}$ $3\alpha = -3$ $\alpha = -1$ dan -2 (b) $\alpha(2\alpha) = \frac{-2m+1}{3}$ $2\alpha^2 = \frac{-2m+1}{3}$ $2(-1)^2 = \frac{-2m+1}{3}$ $m = -\frac{5}{2}$	1m 1m1m 1m 1m 1m	<hr/> 6 markah
3.	(a) $(p-5m)\underline{i} + (-12+12m)\underline{j} = -\underline{i} + 12\underline{j}$ <i>compare</i> $-12+12m = 12$ $m = 2$ $p-5m = -1$ $p-5(2) = -1$ $p = 9$ (b) $-5\underline{i} + 12\underline{j} = \lambda(5\underline{i} + k\underline{j})$ $k = -12$	1m 1m 1m 1m 1m	

	<p>(c) Find $a + b = 4i$</p> <p>Find $a + b = 4$ or</p> <p>$b = 13$ or</p> <p>$a = 15$</p> <p>$n(4 + 13) = 15$</p> <p>$n = \frac{15}{17}$</p>	<p>1m</p> <p>1m</p> <p>1m</p>	<p>8 markah</p>
4.	<p>(a) $P(35 < x < 50) = \frac{35 - 50}{20} < x < \frac{55 - 50}{20}$</p> <p>$= -1 < x < 0.25$</p> <p>$= 0.4405$</p> <p>(b) $P(Z < -0.5) = 0.69146$</p> <p>$0.69146 \times 150 = 103.719 // 104$ calon</p> <p>(c) $\frac{t - 50}{20} = 1.036$</p> <p>$t = 70.72$</p>	<p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p>	<p>8 markah</p>
5.	<p>(a) LHS=RHS</p> <p>$2 \frac{\sin x}{\cos x} [2 \cos^2 x]$</p> <p>$2(2 \sin x \cos x)$</p> <p>$2 \sin 2x$</p> <p>(b) i - shape of positive sinus curve</p> <p>ii - 2 cycles for $0 \leq x \leq 2\pi$</p> <p>iii - maximum = 2 and minimum = -2</p> <p>(c)</p>  <p>$y = 2 - \frac{2x}{\pi}$</p> <p>Draw the straight line</p> <p>Number of solution = 5</p>	<p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p>	<p>8 markah</p>

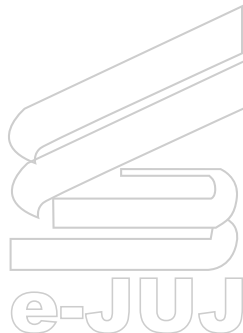
6.	<p>(a) $y = x(x-1)(x-2)$ $\therefore p = 1, q = 2$</p> <p>(b) Luas dibawah lengkung = $\int_0^1 x^3 - 3x^2 + 2x dx + \left \int_1^2 x^3 - 3x^2 + 2x dx \right$</p> $= \left[\frac{x^4}{4} - x^3 + x^2 \right]_0^1 + \left \left[\frac{x^4}{4} - x^3 + x^2 \right]_1^2 \right $ <p>= use limit 0,1 and 1,2 into</p> $\left[\frac{x^4}{4} - x^3 + x^2 \right]_0^1 + \left \left[\frac{x^4}{4} - x^3 + x^2 \right]_1^2 \right $ $= \frac{1}{2}$ <p>Area of cycle = $\frac{1}{2}(1)^2(2\pi)$ or Area of quadrant = $\frac{1}{2}(1)^2\left(\frac{\pi}{2}\right)$</p> $= \pi$ <p>Luas rantau berlorek = $\pi - \frac{\pi}{4} - \frac{1}{2} = 1.857$</p>	<p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p>	<p>8 markah</p> <hr/> <p>7 markah</p>
7.	<p>(a) (i) $\sqrt{10^2 - 8^2}$ $\therefore P(8,6)$</p> <p>(ii) Area = $\frac{1}{2} (8)(21) + (16)(-3) - (16)(6) - (12)(21)$ $= 18$</p> <p>(b) $A(x, y) = \left(\frac{12(3) + 16(1)}{4}, \frac{-3(3) + 21}{4} \right)$ $A(x, y) = (13, 3)$ $y - 3 = \frac{1}{6}(x - 13)$ $y = -\frac{1}{6}x + \frac{31}{6}$(1) $y = \frac{3}{4}x$(2) Using simultaneous equation to find x and y $x = \frac{62}{11}, y = \frac{93}{22}$</p>	<p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p>	<p>10 markah</p>

<p>8.</p>	<p>(a) $\pi r^2 t = 500$ $t = \frac{500}{\pi r^2}$ Area = $2\pi r^2 + 2\pi r t$ $= 2\pi r^2 + 2\pi r \left(\frac{500}{\pi r^2}\right)$ $= 2\pi r^2 + 1000r^{-1}$ $\frac{dA}{dr} = 4\pi r - 1000r^{-2}$ $\frac{dA}{dr} = 0, 4\pi r - \frac{1000}{r^2} = 0$ $r = 4.301$</p> <p>(b) (i) $A = \pi r^2$ $\frac{dA}{dr} = 2\pi r$ $\frac{dA}{dt} = \frac{dA}{dr} \times \frac{dr}{dt}$ $= 2\pi r \times 3$ $= 30\pi \text{ cm}^2 \text{ s}^{-1}$</p> <p>(ii) $\delta r = 5.02 - 5$ $= 0.02$ $\delta A = \frac{dA}{dr} \times \delta r$ $= (2\pi r)(0.02)$ $= 0.2\pi$</p>	<p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p>	<p>10 markah</p>							
<p>9.</p>	<p>(a) Table</p> <table border="1" data-bbox="312 1395 1161 1496"> <tr> <td>$\frac{y}{x}$</td> <td>1.74</td> <td>1.62</td> <td>1.51</td> <td>1.36</td> <td>1.24</td> <td>1.12</td> </tr> </table> <p>Plot one point with scale giving Plot all point correctly Line of best fit</p> <p>(b) (i) $x = 2.2, y = 3.17 \pm 0.1$</p> <p>(ii) Find $m = -0.25 \pm 0.1$ Find $c = 2.0 \pm 0.1$ Substitute m and c into $Y = mX + c$: $Y = -0.25X + 2.0$ Use $Y = \frac{y}{x}$ and $X = x$: $\frac{y}{x} = -0.25x + 2$</p>	$\frac{y}{x}$	1.74	1.62	1.51	1.36	1.24	1.12	<p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p>	
$\frac{y}{x}$	1.74	1.62	1.51	1.36	1.24	1.12				

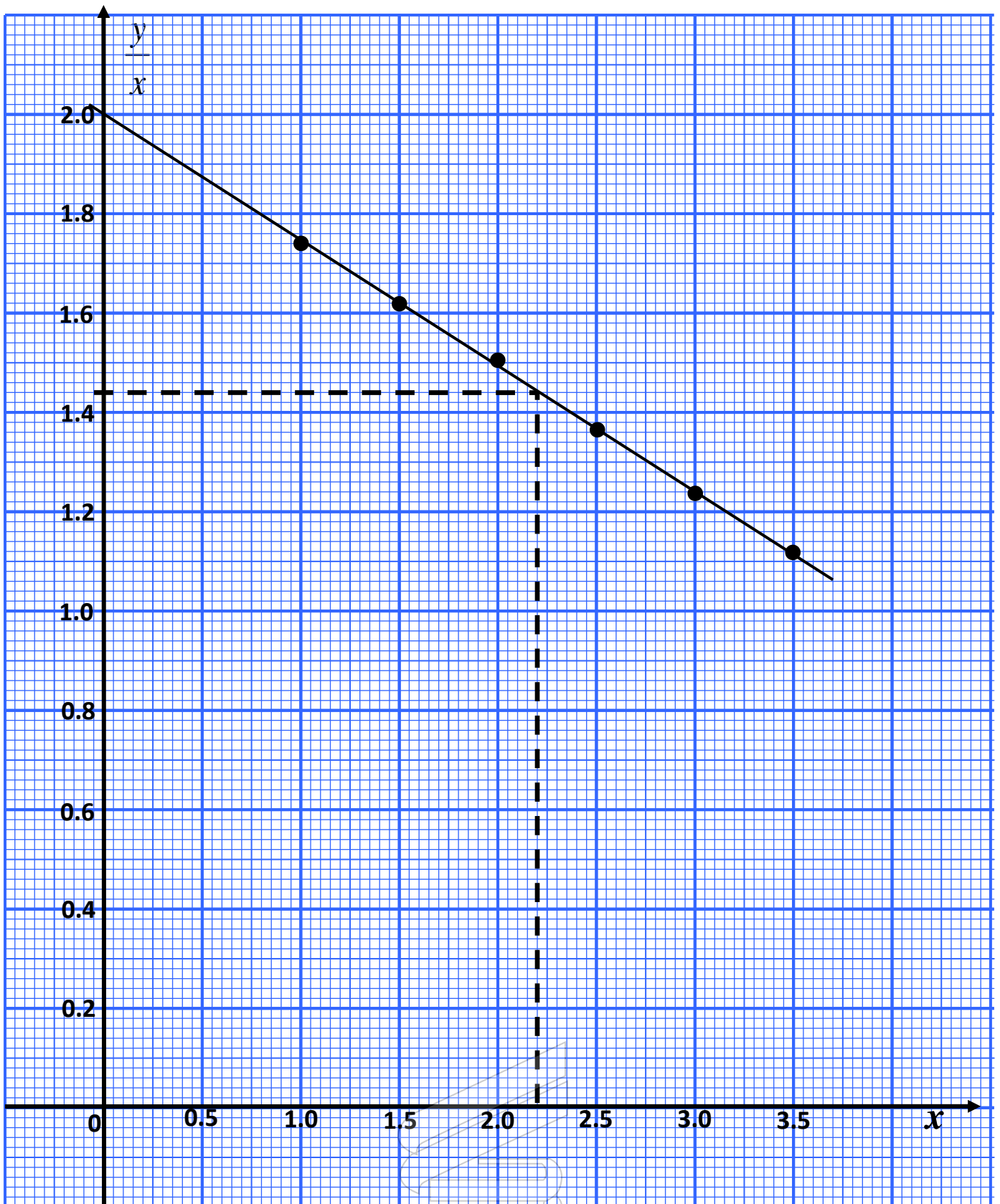
	$y = -0.25x^2 + 2x$	1m	10 markah
10.	<p>(a) $\sin P = \frac{5}{12}$ $P = 0.43 \text{ rad}$</p> <p>(b) $S_{Ac} = 12(0.43) = 5.16$ $S_{RQ} = 24(0.43) = 10.08$ $Perimeter = 12 + 12 + 5.16 + 10.08$ $Perimeter = 39.24 \text{ km}$</p> <p>(c) $A_{PQR} = \frac{1}{2}(24)^2(0.43) = 123.84 \text{ km}^2$ $A_{PAC} = \frac{1}{2}(12)^2(0.43) = 30.96 \text{ km}^2$ $A = 123.84 - 30.96$ $A = 92.88 \text{ km}^2$</p>	<p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p>	<hr/> 10 markah
11.	<p>(a) $\min_x = \frac{7+8+8+6+7+9}{6} = 7.5$ $\min_y = \frac{8+6+9+6+9+7}{6} = 7.5$ $\sigma_x = \sqrt{\frac{\sum(7^2 + 8^2 + 8^2 + 6^2 + 7^2 + 9^2)}{6} - (7.5)^2}$ $\sigma_y = \sqrt{\frac{\sum(8^2 + 6^2 + 9^2 + 6^2 + 9^2 + 7^2)}{6} - (7.5)^2}$ \therefore pemain x dipilih</p> <p>(b) (i) $L = 30.5 @ f_m = q @ F = 5 + p @ C = 10$ $34.25 = 30.5 + \left[\frac{15 - (5 + p)}{q} \right] 10 \dots\dots\dots(1)$ $30 = 5 + p + q + 6 + 4 \dots\dots\dots(2)$ Solve simultaneous equation to find the value of p and of q $p = 7, q = 8$</p> <p>(ii) refer histogram Draw histogram Draw line to find mode Mode mark = 33.5</p>	<p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p>	<hr/> 10 markah

12.	<p>(a) $29 = \frac{1}{2}(6)(10)\sin\theta$</p> <p>$\theta = 104.84^\circ$</p> <p>(b) $c^2 = 6^2 + 10^2 - 2(6)(10)\cos 104.84^\circ$</p> <p>$c^2 = 166.73$</p> <p>$c = 12.92$</p> <p>(c) $\frac{\sin A}{12.92} = \frac{\sin 45^\circ}{9.5}$</p> <p>$\angle A = 74.56^\circ$</p> <p>$\angle ABD = 180^\circ - 74.56^\circ - 45^\circ$</p> <p>$= 60.44^\circ$</p> <p>$\angle DA'B = 105.44^\circ$</p> <p>$\angle A'BD = 180^\circ - 105.44^\circ - 45^\circ$</p> <p>$= 29.56^\circ$</p>	<p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p>	<p style="text-align: right;"><u>10 markah</u></p>
13.	<p>(a) 7</p> <p>(b) $\frac{dv}{dt} = a = 6 - 2t$</p> <p>$6 - 2t = 0$</p> <p>$t = 3$</p> <p>(c) $v = 7 + 6(3) - (3)^2$</p> <p>$= 16 \text{ ms}^{-1}$</p> <p>(d) $\int_0^7 7 + 6t - t^2 dt + \left \int_7^9 7 + 6t - t^2 dt \right$</p> <p>$\left[7t + 3t^2 - \frac{t^3}{3} \right]_0^7 + \left[7t + 3t^2 - \frac{t^3}{3} \right]_7^9$</p> <p>$\left[\left(7(7) + 3(7)^2 - \frac{(7)^3}{3} \right) - \left(7(0) + 3(0)^2 - \frac{(0)^3}{3} \right) \right] + \left[\left(7(9) + 3(9)^2 - \frac{(9)^3}{3} \right) - \left(7(7) + 3(7)^2 - \frac{(7)^3}{3} \right) \right]$</p> <p>$\frac{245}{3} + \left -\frac{56}{3} \right$</p> <p>$100\frac{1}{3}$</p>	<p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p>	<p style="text-align: right;"><u>10 markah</u></p>
14.	<p>(a) I - $x + y \leq 80$</p> <p>II - $\frac{x}{y} \geq \frac{1}{5}$</p> <p>$y \leq 5x$</p> <p>III - $100x + 80y \geq 5000$</p>	<p>1m</p> <p>1m</p> <p>1m</p>	

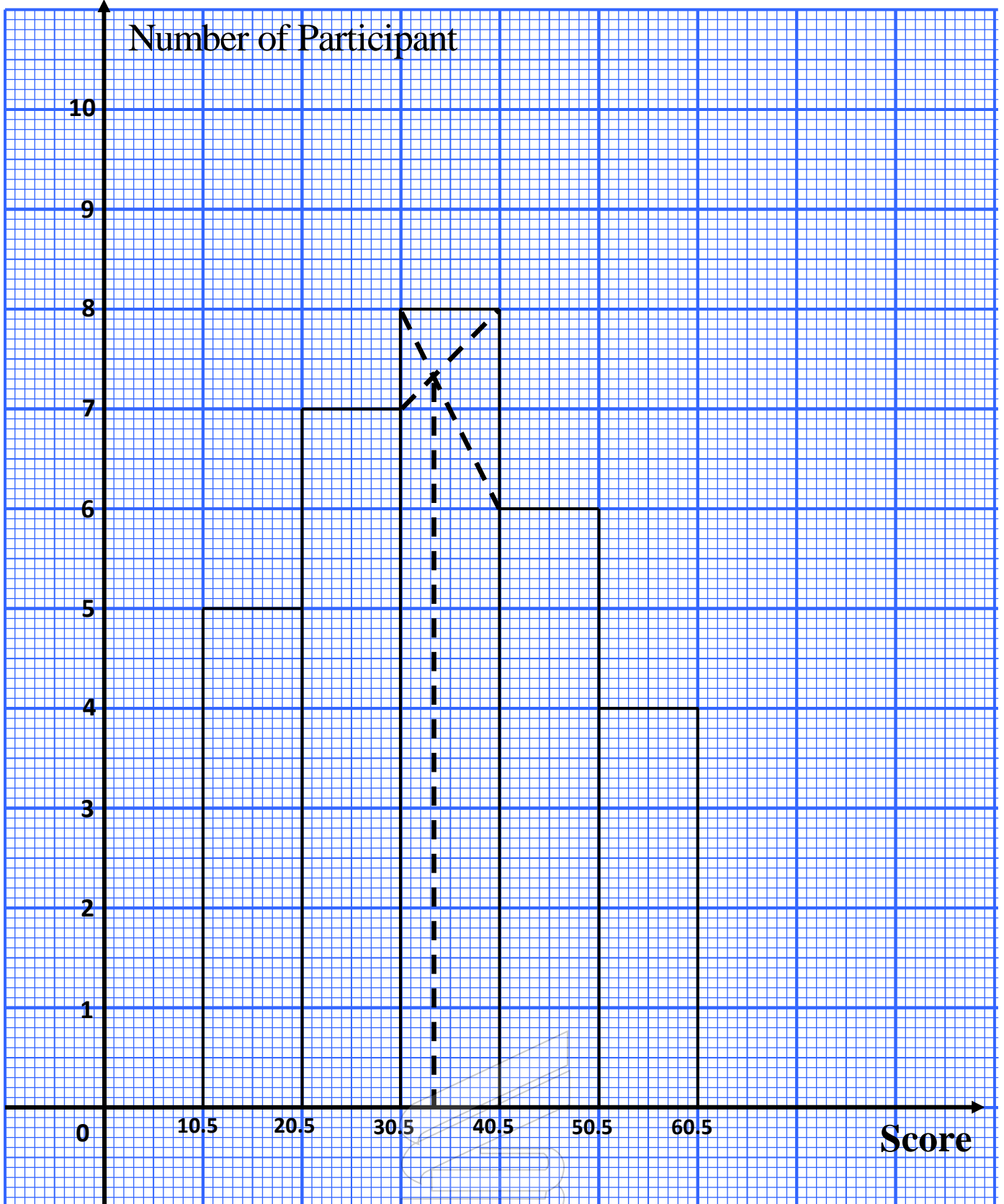
	<p>(b) Draw 1 line correctly</p> <p>Draw all line correctly</p> <p>Shaded the region</p> <p>(d) (i) 50</p> $\text{Kutipan Maksimum} = 100(13) + 80(67)$ $= RM 5490$ $\text{Keuntungan Maksimum} = \frac{30}{100} \times 5490$ $= RM1,647$	<p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p>	<p style="text-align: right;"><u>10 markah</u></p>
<p>15.</p>	<p>(a) $120 = \left(\frac{6000}{P_{08}} \right) \times 100$</p> $P_{08} = RM 5000.00$ <p>(b) $\bar{I}_{10/08} = \frac{120(50) + 150(20) + 110(30)}{100}$</p> $= 123$ <p>(c) $123 = \frac{P_{10}}{20000} \times 100$</p> $P_{10} = RM 24,600.00$ <p>(d) $\bar{I}_{10/08} = \frac{120(50) + 150(20) + 110(30)}{100}$</p> $\bar{I}_{12/10} = \frac{120(50) + 195(20) + 132(30)}{100}$ $= 123$ $\bar{I}_{12/08} = \frac{123(138.6)}{100}$ $= 170.5$	<p>1m</p> <p>1m</p> <p>1m1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p> <p>1m</p>	<p style="text-align: right;"><u>10 markah</u></p>



Soalan 8



Soalan 11



Soalan 14

