



**PRAKTIS BESTARI**  
**PROJEK JAWAB UNTUK JAYA (JUJ) 2018**



**SIJIL PELAJARAN MALAYSIA**  
**ADDITIONAL MATHEMATICS**  
**Kertas 2 / Set 1**

**3472/2**

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**PERATURAN PEMARKAHAN**

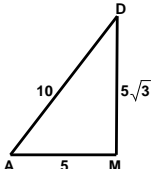
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Peraturan Pemarkahan ini mengandungi 13 halaman bercetak

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BIL	PERATURAN PEMARKAHAN	MARKAH	JUMLAH MARKAH
1	<p>(a) <math>\mu = 200(0.48)</math> OR <math>\sigma = \sqrt{200(0.48)(0.52)}</math>  <math>\mu = 96</math> <math>\sigma = 7.065</math></p> <p>(b) Use: <math>p = 0.48, q = 0.52</math> in <math>P(X = 5)</math> or <math>P(X = 6)</math> or <math>P(X = 7)</math>  OR Use: <math>p = 0.52, q = 0.48</math> in <math>P(X = 0)</math> or <math>P(X = 1)</math> or <math>P(X = 2)</math></p> <p><math>1 - P(X = 5) - P(X = 6) - P(X = 7)</math>  OR <math>1 - P(X = 0) - P(X = 1) - P(X = 2)</math></p> <p>0.8049</p>	<p>1M 1M, 1M</p> <p>1M</p> <p>1M</p> <p>1M</p>	<hr/> <p>6</p>
2	<p>(a) <math>\frac{n}{8} = 3</math>  <math>m(2) + n = 8</math>  <math>k = 0, n = 24, m = -8</math></p> <p>(b) <math>g^2(y) = \frac{24}{y}</math>  <math>g^p(y) = y</math></p>	<p>1M</p> <p>1M 2M/1M/0</p> <p>1M</p> <p>1M</p>	<hr/> <p>6</p>
3	<p>gantikan ke <math>x = \sqrt{k-4}</math> dalam persamaan <math>y = x^2 + 2</math>  <math>\therefore y = k - 2</math></p> <p><math>\pi \int_2^{k-2} y - 2 dy = 8\pi</math></p> <p><math>\pi \left[ \frac{y^2}{2} - 2y \right]_2^{k-2} = 8\pi</math></p> <p><math>\left[ \frac{(k-2)^2}{2} - 2(k-2) \right] - \left[ \frac{2^2}{2} - 2(2) \right] = 8</math></p> <p><math>k(k-8) = 0</math>  <math>k = 8</math></p>	<p>1M</p> <p>1M</p> <p>1M</p> <p>1M</p> <p>1M</p> <p>1M</p>	

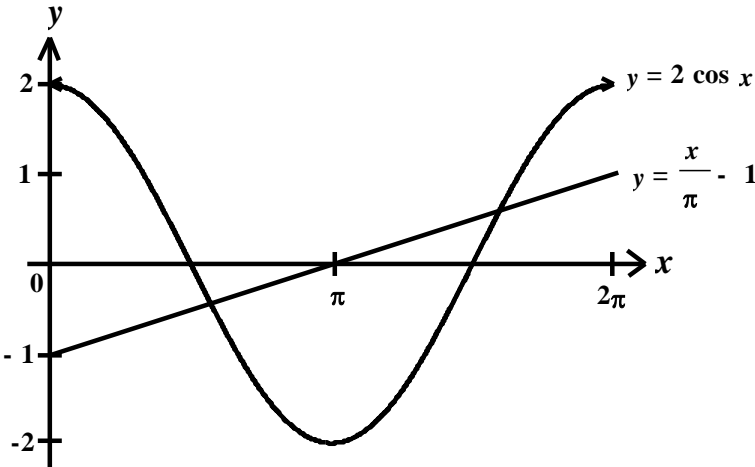
	<b>OR</b>		
	$\pi \int_2^y y - 2dy = 8\pi$	1M	
	$\pi \left[ \frac{y^2}{2} - 2y \right]_2^y = 8\pi$	1M	
	$(y-6)(y+2) = 0$	1M	
	$y = 6, x = 2$	1M	
	$\sqrt{k-4} = 2$	1M	
	$k = 8$	1M	
			<hr/> 6
4	 <p>a) <span style="margin-left: 150px;">OR</span> <math>DM = \sin 60^\circ \times 10</math></p> <p><math>\angle EBX = \sin^{-1} \frac{5\sqrt{3}}{15}</math></p> <p>0.6155 rad</p> <p>b) Luas sector minor <math>ADX = \frac{1}{2}(10)^2 \left( 60 \times \frac{3.142}{180} \right) = 52.37 \text{ m}^2</math></p> <p>Or</p> <p>Luas sector minor <math>BEX = \frac{1}{2}(15)^2 \left( 35.26 \times \frac{3.142}{180} \right) = 69.24 \text{ m}^2</math></p> <p><math>DE = AB - AM - BN</math></p> <p><math>AM = \sqrt{10^2 - (5\sqrt{3})^2}</math> or <math>\cos 60^\circ \times 10 = 5</math> Or</p> <p><math>BN = \sqrt{15^2 - (5\sqrt{3})^2}</math> or <math>\cos 35.26^\circ \times 15 = 12.2474</math></p> <p><math>DE = 25 - 5 - 12.2474 = 7.7526</math></p> <p>Luas kolam = <math>\frac{1}{2}(7.7519 + 25)5\sqrt{3} - (52.37 + 69.24) = 20.21 \text{ m}^2</math></p> <p>20.22 m<sup>2</sup></p>	1M	
		1M	
		1M	
		1M	
		1M	
		1M	
		1M	
		1M	<hr/> 8

SULIT

5	$16xy = 1408$ $4x + 4y + 64 = 140$  $x = 19 - y$ OR $y = 19 - x$  $y(19 - y) = 88$ $x(19 - x) = 88$  $(y - 11)(y - 8) = 0$ $(x - 11)(x - 8) = 0$  $x = 11, y = 8 \quad \therefore x > y$  Tidak muat, diameter kek dan pelapik = 12 cm	1M 1M 1M 1M 1M 1M 1M	<hr/> 7
6	a) $h_2 = 3\hat{i} + 2\hat{j}$  $ h_2  = \sqrt{3^2 + 2^2}$  $\frac{3\hat{i} + 2\hat{j}}{\sqrt{13}}$  b) i) $5\hat{i} + 8\hat{j} + 3\hat{i} + 2\hat{j} + 3\hat{i} + 9\hat{j} - 7\hat{i} - 6\hat{j}$  $4\hat{i} + 13\hat{j}$  ii) $\sqrt{4^2 + 13^2}$  13.60km	1M 1M 1M  1M 1M 1M	<hr/> 7

7	<p>a) <math>m_{AB} = \frac{2 - (-1)}{1 - 3} = -2n</math></p> <p><math>n = \frac{3}{4}</math></p> <p>b) <math>m_{BC} = \frac{3}{4}</math></p> <p><math>y - (-1) = \frac{3}{4}(x - 3)</math></p> <p><math>4y = 3x - 13</math></p> <p><math>m_{AC} = 2\left(\frac{3}{4}\right) = \frac{3}{2}</math></p> <p><math>y - 2 = \frac{3}{2}(x - 1)</math></p> <p><math>2y = 3x + 1 @ 4y = 6x + 2</math></p> <p><math>3x - 13 = 6x + 2</math></p> <p><math>x = -5</math></p> <p><math>C(-5, -7)</math></p> <p>c) <math>L = \frac{1}{2} -1 - 21 - 10 - (6 + 5 - 7) </math></p> <p><math>L = 18</math></p> <p>d) <math>\sqrt{(x-1)^2 + (y-2)^2}</math> Or <math>\sqrt{(1+5)^2 + (2+7)^2}</math></p> <p><math>3\sqrt{(x-1)^2 + (y-2)^2} = \sqrt{(1+5)^2 + (2+7)^2}</math></p> <p><math>x^2 + y^2 - 2x - 4y - 8 = 0</math></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/> <p>10</p>
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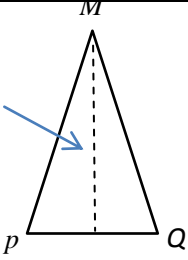
8	<p>a)</p> <table border="1" data-bbox="365 215 1082 347"> <thead> <tr> <th><math>x</math></th> <th>0.5</th> <th>2.5</th> <th>3.5</th> <th>5.0</th> <th>7.0</th> <th>8.5</th> </tr> </thead> <tbody> <tr> <td><math>\log_{10} y</math></td> <td>0.32</td> <td>0.48</td> <td>0.56</td> <td>0.68</td> <td>0.84</td> <td>0.96</td> </tr> </tbody> </table> <p>b) Plot 1 point correctly            Plot all points correctly            Line of the best fit</p> <p>c) i) <math>\log_{10} 4 = 0.6</math>  <math>x = 4</math></p> <p>ii)  <math>y = pq^{2x}</math>  <math>\log_{10} y = (2\log_{10} q)x + \log_{10} p</math>  <math>\log_{10} p = c</math>  <math>\log_{10} p = 0.28 \pm 0.02</math>  <math>p = 1.905</math></p> <p>iii)  <math>2\log_{10} p = m</math>  <math>2\log_{10} n = 0.08 \pm 0.02</math>  <math>n = 1.096</math></p>	$x$	0.5	2.5	3.5	5.0	7.0	8.5	$\log_{10} y$	0.32	0.48	0.56	0.68	0.84	0.96	<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</p>
$x$	0.5	2.5	3.5	5.0	7.0	8.5											
$\log_{10} y$	0.32	0.48	0.56	0.68	0.84	0.96											
9	<p>a) i) LHS  <math>\cos(x + 60^\circ) + \cos(x - 60^\circ)</math>  <math>\cos x \cos 60^\circ - \sin x \sin 60^\circ + \cos x \cos 60^\circ + \sin x \sin 60^\circ</math>  <math>2\cos x \cos 60^\circ</math>  <math>2\left(\frac{1}{2}\right)\cos x</math>  <math>\cos x</math> (proved)</p> <p>ii) Panduan <math>x = 45^\circ</math>  <math>x = 135^\circ, 225^\circ</math></p>	<p>1M</p> <p>1M</p> <p>1M</p> <p>1M</p> <p>1M</p> <p>1M</p>															

	<p>(b) (i) Shape &amp; cycle Amplitude</p>  <p>(ii) <math>y = \frac{x}{\pi} - 1</math> Draw line No of solution = 2</p>	<p>1M 1M</p> <p>1M 1M 1M</p>	<p style="text-align: center;">10</p>
10	<p>(a) <math>\frac{dy}{dx} = 6x - 6px^2</math> <math>6(-2) - 6p(-2)^2 = -18</math> <math>p = \frac{1}{4}</math></p> <p>(b) <math>\frac{dy}{dx} = 6x - \frac{3}{2}x^2 = 0</math> <math>x(6 - \frac{3}{2}x) = 0</math> Turning points ( 0 , 0 ) and ( 4 , 16 ) <math>\frac{d^2y}{dx^2} = 6 - 3x</math></p>	<p>1M 1M 1M 1M 1M</p>	

	$\frac{d^2y}{dx^2} = 6, \quad \frac{d^2y}{dx^2} > 0 \quad (0,0) \text{ Titik minimum and}$ $\frac{d^2y}{dx^2} = -6, \quad \frac{d^2y}{dx^2} < 0 \quad (4,16) \text{ Titik Maksimum}$	1M	
	(c) $2\left(6x - \frac{3}{2}x^2\right) - x(6 - 3x) - 6x$	1M	
	$= 0$	1M	
11	(a) $\frac{5(3) + 8(8) + k(13) + 4(18) + 3(23) + 5(28)}{25 + k} = 14$	1M	
	$k = 10$	1M	
	(b) 15.5 / 5.5 or 26.25/8.75 or 23/5 or 4/8 seen	1M	
	$15.5 + \left[\frac{26.25 - 23}{4}\right]5 \quad \text{Or} \quad 5.5 + \left[\frac{8.75 - 5}{8}\right]5$	1M	
	$15.5 + \left[\frac{26.25 - 23}{4}\right]5 - 5.5 + \left[\frac{8.75 - 5}{8}\right]5$	1M	
	Interquartile range = 11.72	1M	
	(c) 6 bars correctly drawn in domain $0.5 \leq x \leq 30.5$ and uniform scale.	1M	
	Method to find the mode	1M	
	Mode = 11.75	1M	
			10



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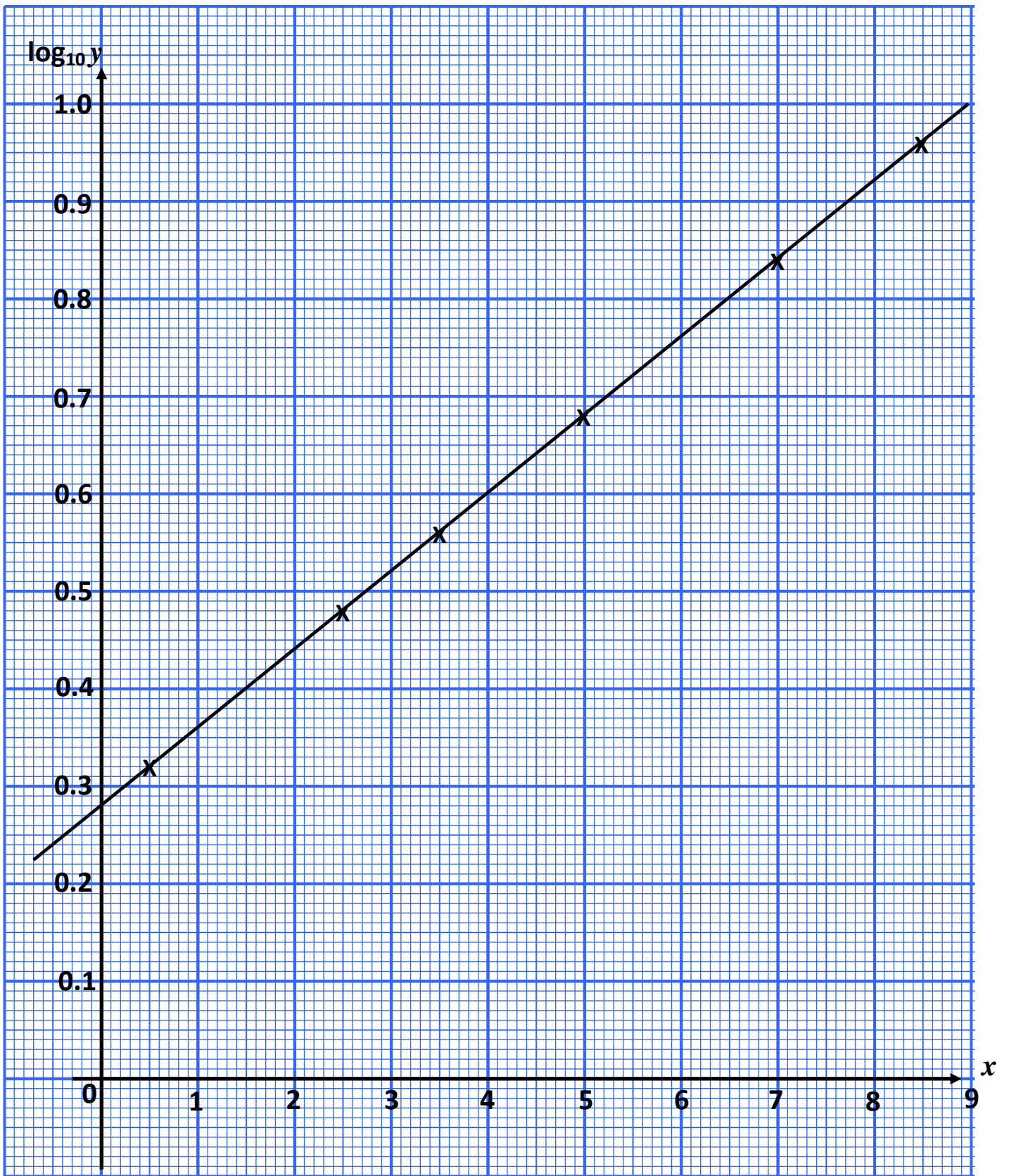
12	<p>(a) <math>\sqrt{208}</math></p> $(MQ)^2 = 3^2 + (\sqrt{208})^2 - 2 \cdot 3 \cdot \sqrt{208} \cos \angle PMQ$ $MQ = 14.73 \text{ cm}$  <p>(b) <math>6^2 = (\sqrt{217})^2 + (\sqrt{217})^2 - 2(\sqrt{217})(\sqrt{217})\cos \angle PMQ</math></p> $\angle PMQ = 23.50^\circ$ <p>(c) <math>A = \frac{1}{2}(\sqrt{217})(\sqrt{217})\sin 23.50^\circ</math></p> $43.26 \text{ cm}^2$ <p>(d) Find</p> $QX^2 = 5^2 + 6^2 - 2(5)(6)\cos 73.78^\circ$ $\frac{\sin \angle PXQ}{6} = \frac{\sin 73.78^\circ}{6.984}$ $57.26^\circ$	<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/> <p>10</p>
13	$125 = \frac{Q}{0.8} \times 100 \text{ or } P = \frac{2.8}{2.0} \times 100 \text{ or } 150 = \frac{0.6}{R} \times 100$ $Q = 1.0 \quad P = 140 \quad R = 0.4$ <p>(b) W = 80 seen</p> <p>(i) <math>\bar{I} = \frac{125(80) + 140(120) + 150(100) + 80(60)}{360}</math></p> $= \text{RM}129.44$ <p>(ii) <math>129.44 = \frac{P_{12}}{585} \times 100</math></p> $P_{12} = \text{RM}757.22$ <p>(c) <math>\frac{129.44}{100} = \frac{I_{14/10}}{120}</math></p> $I_{14/10} = \text{RM}153.33$	<p>1M</p> <p>2M,1M,0</p> <p>1M</p> <p>1M</p> <p>1M</p> <p>1M</p> <p>1M</p> <p>1M</p>	<hr/> <p>10</p>

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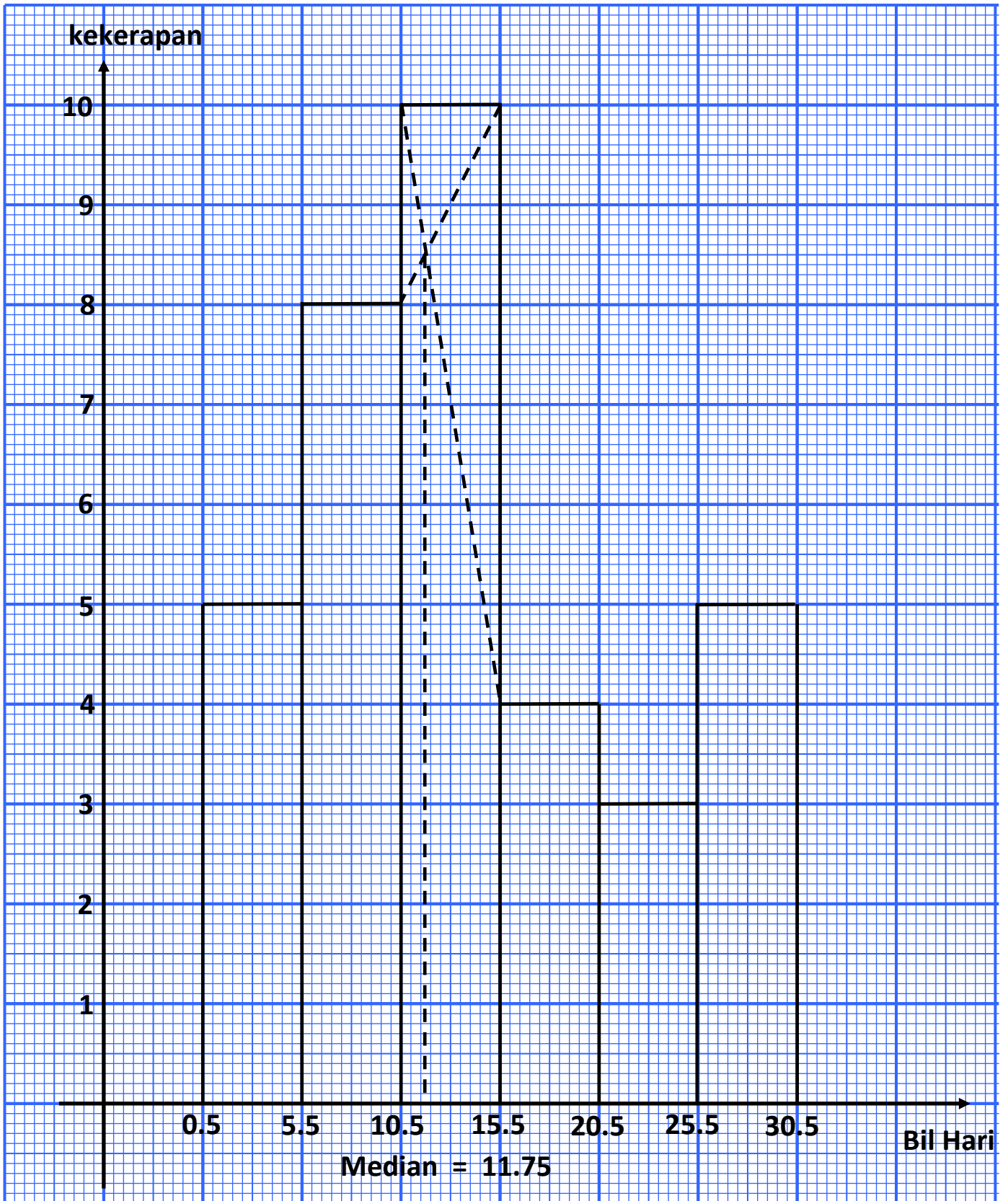
14	<p>(a) (i) 0 ms<sup>-1</sup></p> <p>(ii) <math>\frac{dv}{dt} = 24 - 6t</math></p> <p>Solve <math>24 - 6t = 0</math></p> <p><math>v_4 = 24(4) - 3(4)^2 = 48</math></p> <p>(iii) <math>S = 12t^2 - t^3</math></p> <p>Solve <math>12t^2 - t^3 = 0</math></p> <p><math>t = 12</math></p> <p>(b) Solve <math>24t - 3t^2 = 0</math> to find turning point</p> <p><math>S_8 = 12(8)^2 - (8)^3</math></p> <p><math>S_8 = 256 &lt; 260</math>, Tidak lalu</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/> <p>10</p>
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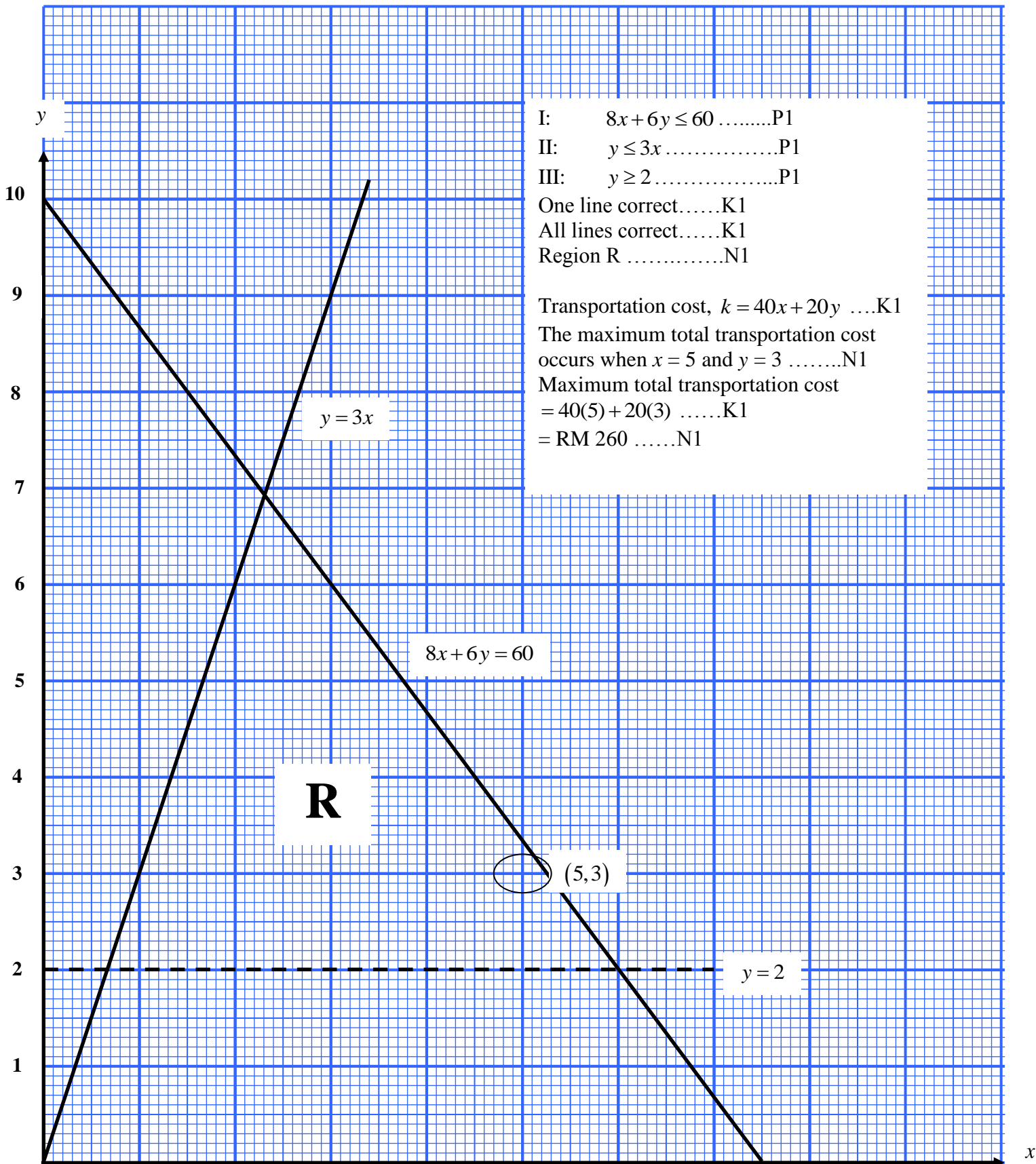
LAMPIRAN SOALAN 8



LAMPIRAN SOALAN 11



LAMPIRAN SOALAN 15



- I:  $8x + 6y \leq 60$  .....P1
- II:  $y \leq 3x$  .....P1
- III:  $y \geq 2$  .....P1
- One line correct .....K1
- All lines correct .....K1
- Region R .....N1

Transportation cost,  $k = 40x + 20y$  ....K1  
The maximum total transportation cost occurs when  $x = 5$  and  $y = 3$  .....N1  
Maximum total transportation cost =  $40(5) + 20(3)$  .....K1  
= RM 260 .....N1