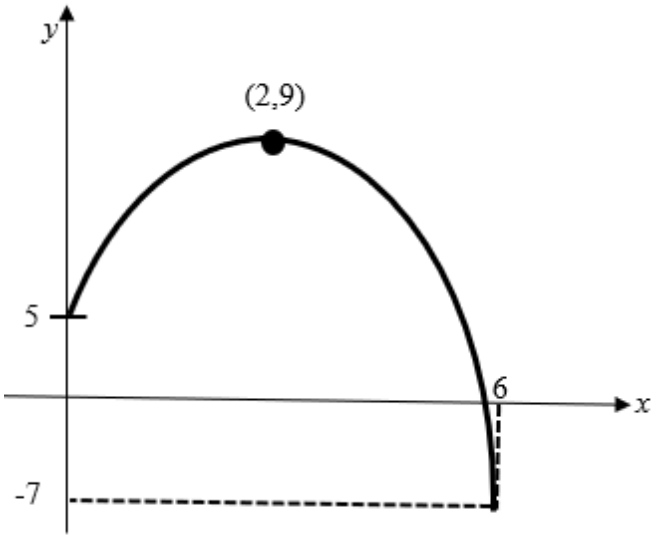
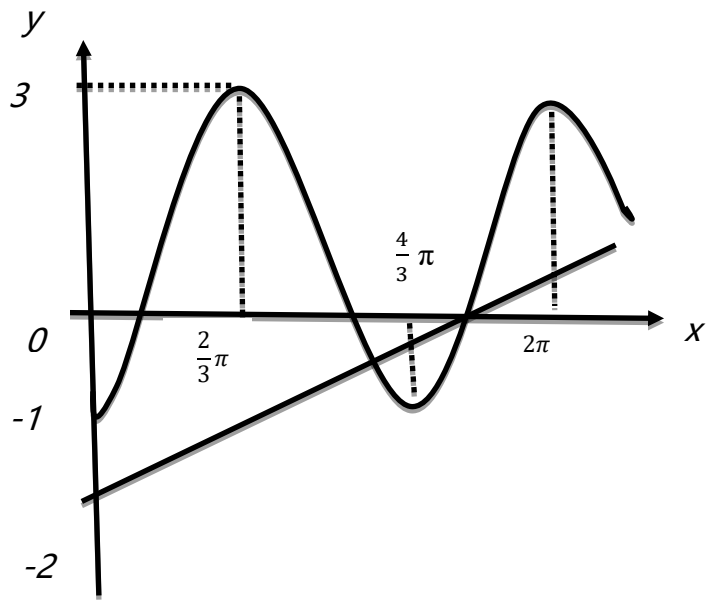
Peraturan Pemarkahan Ujian Diagnostik 3 Tingkatan 5 Matematik Tambahan (Kertas 2 / 2022)

No	Solutions and marking Scheme	Sub marks	Total Marks
1	$y = 3x - 2$ $2x^2 + 3y^2 - 5xy - 16 = 0$ $2x^2 + 3(3x-2)^2 - 5x(3x-2) - 16 = 0$ $7x^2 - 13x - 2 = 0$ $(x-2)(7x+1) = 0$ $x = 2 \quad x = -\frac{1}{7}$ $y = 3(2) - 2$ $= 4$ $y = 3(-\frac{1}{7}) - 2$ $= -2\frac{3}{7}$	1 1 1 1 1	**5**
2(a)	$b > 0$ atau $b \neq 1$	1	**6**
2(b)	$log_p(\frac{p}{\sqrt{q}} \times \sqrt{p}\sqrt{q})$ $1 + \frac{1}{2}\ log_n n$ atau setara $\frac{3}{2}$	1 1 1	
2(c)	$log_{14}6 = \frac{1log_2 6}{1log_2 14}$ atau $\frac{log_2 3 + log_2 2}{log_2 7 + log_2 2}$ $\frac{x+1-y}{y}$	1 1	

3(a) i)	$\frac{x^{10}}{x^5}$ atau $\frac{x^{15}}{x^{10}}$ atau $\frac{x^{20}}{x^{15}}$	1	**7**
	x^5	1	
(a) ii)	$\frac{1}{31} = \frac{x^5}{1-x^5}$	1	
	$\frac{1}{2}$	1	
(b)	$2ar - a = ar^2 - 2ar$	1	
	$\frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(1)}}{2(1)}$	1	
	$2 + \sqrt{3}$ or equivalent	1	
4 (a)	$2 - p = 0$ or $3q = 9$	**1**	**8**
	$p = 2$, $q = 3$	**1 , 1**	
(b)	At $x = 0$, $f(x) = 5$ or $x = 6$, $f(x) = -7$	**1**	
	Maximum point	**1**	
	Correct shape	**1**	
(c)			
	(i) $f(x) = (x - 2)^2 - 9$	**1**	
	(ii) $f(x) = -(x + 2)^2 + 9$	**1**	

5(a)	$\sqrt{3^2+4^2}$ atau 9 - 4 5	1 1	**8**
(b)	$tan\angle OAB = \frac{3}{4}$ atau $sin\angle OAB = \frac{3}{5}$ atau kos$\angle OAB = \frac{4}{5}$ 2.4985 / 2.4984	1 1	
(c)	$\frac{1}{2}(5)^2(2.4985)$ $\frac{1}{2}(5)(5)(sin2.4985)$ atau $\frac{1}{2}(5)(5)(sin143.13)$ $\frac{1}{2}(5)^2(2.4985) - \frac{1}{2}(5)(5)(sin2.4985)$ atau $\frac{1}{2}(5)^2(2.4985) - \frac{1}{2}(5)(5)(sin143.13)$ 23.73 / 23.74	1 1 1 1	
6 (a)	Gunakan $\frac{a}{c} = \sin x$ dan $\frac{b}{c} = \cos x$ dalam teorem Pythagoras $a^2 + b^2 = c^2$ $sin^2x + cos^2x = 1$	 1 1	
(b) i)		1 (negative cos graph) 1 (shifted vertically +1) 1 ($\frac{3}{2}$ cycle in 360°)	**8**
(b) ii)	$y = \frac{x}{\pi} - \frac{3}{2}$ Sketch *straight line correctly Number of solutions = 2	1 1 1	

7	(a) i. $\overrightarrow{TS} = \overrightarrow{TR} + \overrightarrow{RS}$ *or* $\overrightarrow{TK} = \overrightarrow{TR} + \overrightarrow{RK}$ $\overrightarrow{TS} = -8\underset{\sim}{x} + 10\underset{\sim}{y}$ ii. $\overrightarrow{TK} = -8\underset{\sim}{x} + 6\underset{\sim}{y}$ (b) i. $\overrightarrow{TQ} = \overrightarrow{TR} + \overrightarrow{RQ}$ $= -8\underset{\sim}{x} + n(\overrightarrow{RL})$ $= -8\underset{\sim}{x} + n(\overrightarrow{RT} + \overrightarrow{TL})$ $= -8\underset{\sim}{x} + n(8\underset{\sim}{x} + \frac{1}{3}(-8\underset{\sim}{x} + 10\underset{\sim}{y}))$ $= -8\underset{\sim}{x} + \frac{16}{3}n\underset{\sim}{x} + \frac{10}{3}n\underset{\sim}{y}$ $\overrightarrow{TQ} = \left[\frac{16}{3}n - 8\right]\underset{\sim}{x} + \frac{10}{3}n\underset{\sim}{y}$ ii. $\left[\frac{16n}{3} - 8\right]\underset{\sim}{x} + \frac{10}{3}n\underset{\sim}{y} = \lambda\left[-8\underset{\sim}{x} + 6\underset{\sim}{y}\right]$ or equivalent $-8\lambda = \frac{16n}{3} - 8 \quad or \quad \frac{10n}{3} = 6\lambda$ $n = \frac{9}{11}$	1 1 1 1 1 1 1	**8**
8 **(a)**	<table><tr><td>R</td><td>1</td><td>3</td><td>4</td><td>6</td><td>8</td><td>10</td></tr><tr><td>$\frac{P-200}{R}$</td><td>1.00</td><td>−0.10</td><td>−0.50</td><td>−2.00</td><td>−2.88</td><td>−4.00</td></tr></table> Graf (Rujuk Lampiran) 1 titik diplot dengan betul dan skala yang seragam 6 titik diplot dengan betul Garis lurus penyuaian terbaik	1 1 1 1	**10**
(b) i)	P -200 = $aR - bR^2$ $\frac{P-200}{R} = -bR + a$ pintasan-Y , a = 1.45 ↔ 1.55	 1 1	
(b) ii)	kecerunan , $-b = m$ and use any two points on LBF to m b = 0.55 ↔ 0.56	1 1	

(c)	Bila $R = 7$ $\frac{P-200}{R} = -2.3$ $P = 183.9$	1 1	
9	$m_{HG} = m_{EF} = 2$ $y-13 = 2(x-8)$ $y-13 = 2x-16$ $y = 2x-3$	1 1	**10**
	$m_{EH} = -\frac{1}{2}$ $y-3 = -\frac{1}{2}\left(x-\left(-2\right)\right)$ $y-3 = -\frac{1}{2}x-1$ $y = -\frac{1}{2}x+2$	1 1 1	
	$2x-3 = -\frac{1}{2}x+2$ $\frac{5}{2}x = 5$ $x = 2$ *or* $y = 2(2)-3$ $=1$ $H(2,1)$	1 1	
	Luas segi empat tepat $EFGH = 2\times\Delta EGH$ $= 2\times\frac{1}{2}\begin{vmatrix} -2 & 8 & 2 & -2 \\ 3 & 13 & 1 & 3 \end{vmatrix}$ $= \left\lvert(-2)(13)+(8)(1)+(2)(3)-\left((3)(8)+(13)(2)+(1)(-2)\right)\right\rvert$ $= \lvert-12-48\rvert$ $= 60\,unit^2$	1 1 1	

<table>
<tr>
<td>10</td>
<td>$\frac{dy}{dx} = 2x - \frac{2}{x^2}$

Pada titik pegun , $\frac{dy}{dx} = 0$, $x = k$, $maka$

$2k - \frac{2}{k^2} = 0$

k = 1</td>
<td>1

1</td>
<td rowspan="3">10</td>
</tr>
<tr>
<td></td>
<td>
<table>
<tr><td>x</td><td>0.5</td><td>1</td><td>1.5</td></tr>
<tr><td>$\frac{dy}{dx}$</td><td>-7</td><td>0</td><td>$2\frac{1}{9}$</td></tr>
<tr><td>tangen
tangent</td><td>\</td><td>——</td><td>/</td></tr>
<tr><td colspan="4">(1, 8) merupakan titik minimum.</td></tr>
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1</td>
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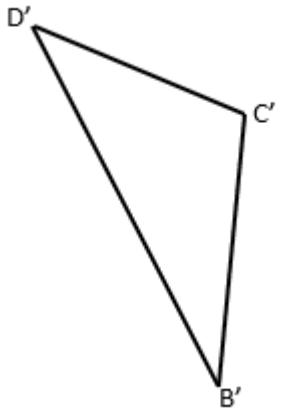
<td>$\int_0^3 (y^2 + 10)dy \quad or \quad \frac{1}{2}(1 + k)(3)$
$\int_0^3 (y^2 + 10)dy - \frac{1}{2}(1 + k)(3) = 9$
$\left[\frac{y^3}{3} + 10y\right]_0^3 - \frac{3}{2} - \frac{3}{2}k = 9$

$\left[\left(\frac{3^3}{3} + 10\text{x}\,3\right) - 0\right] - \frac{3}{2} - \frac{3}{2}k = 9$
k = 19</td>
<td>1

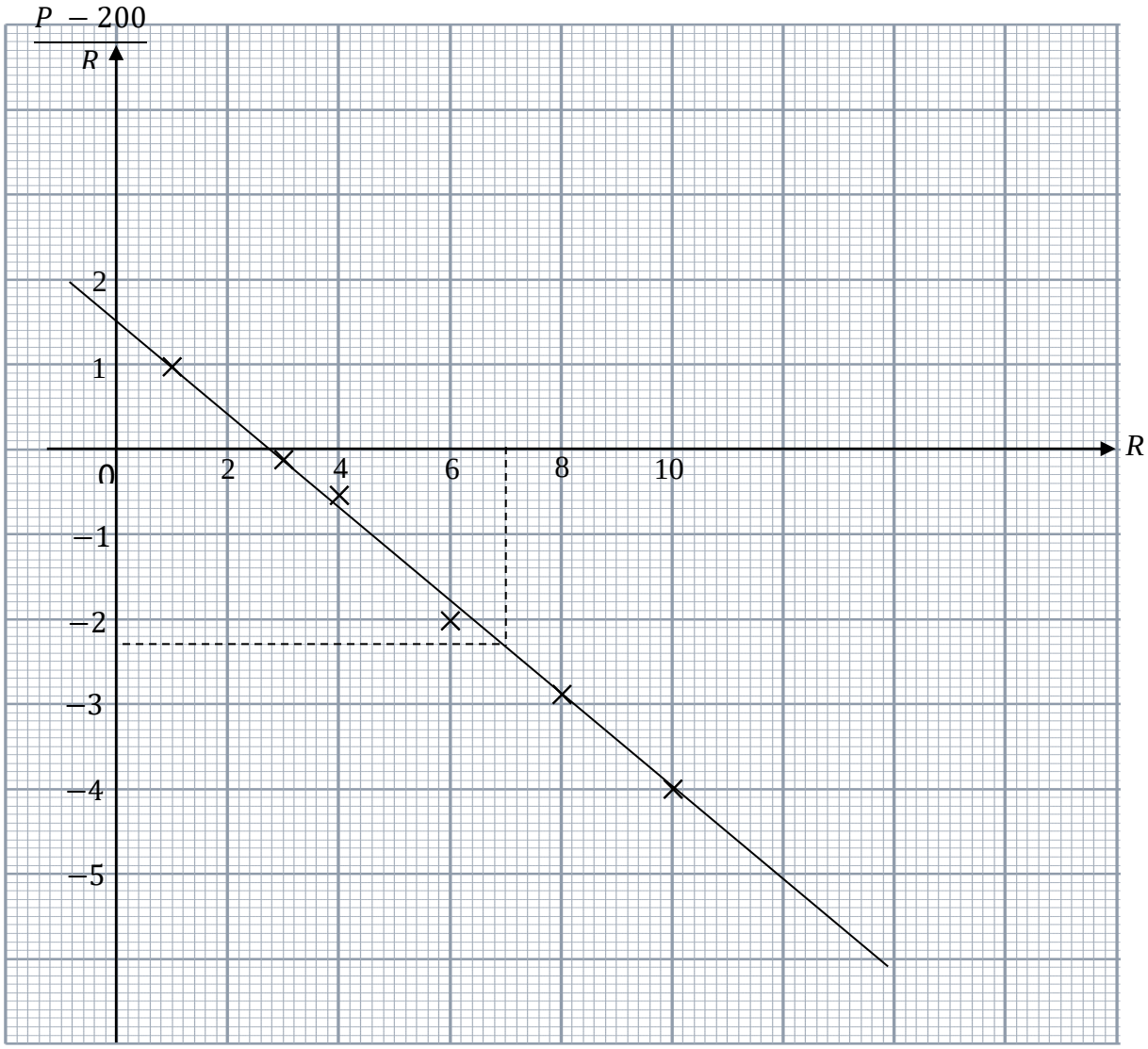
1
1

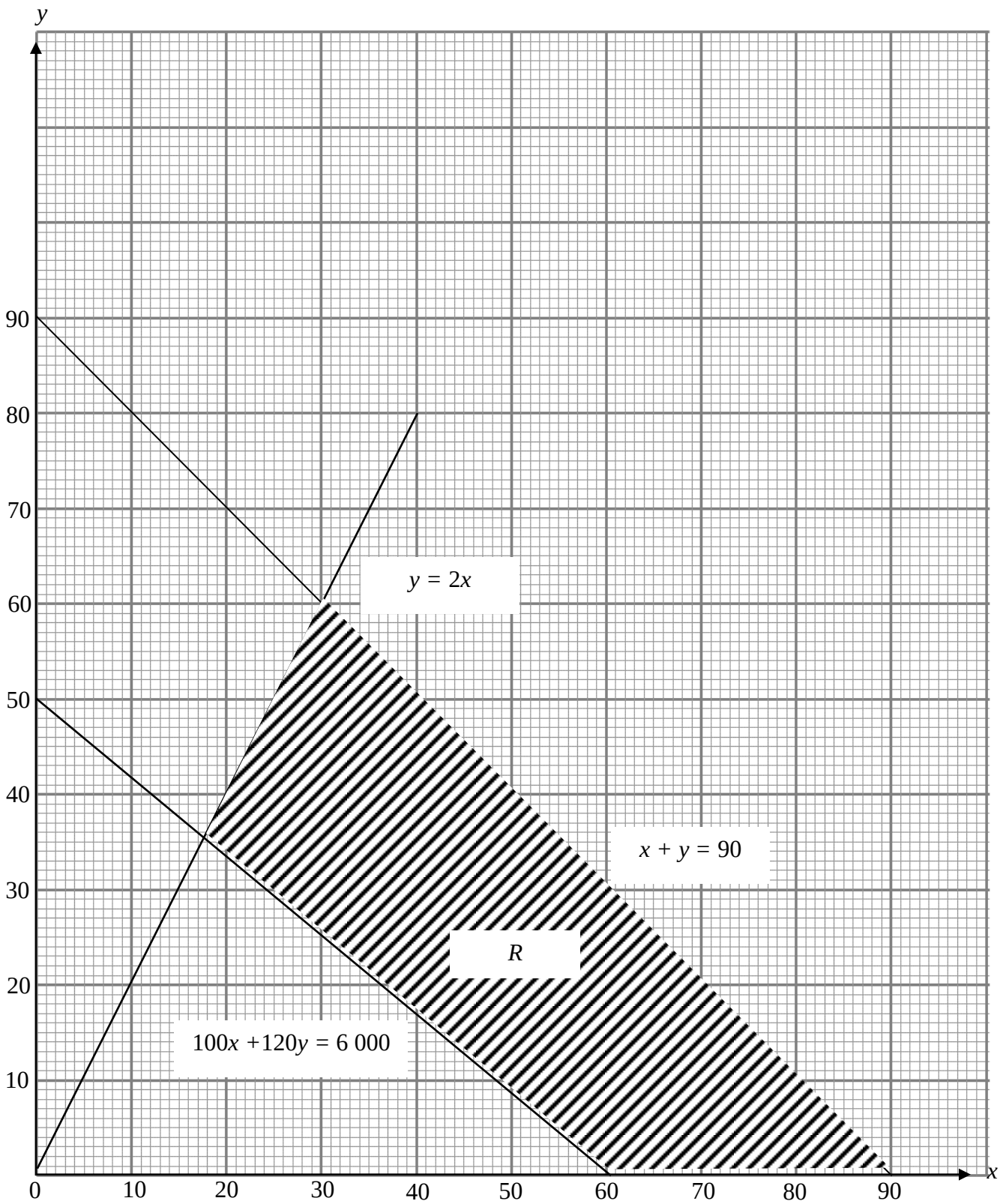
1
1</td>
</tr>
</table>

11 **(a) i)**	$\frac{16.5-12}{\sigma} = 2.25$ σ = 2	1 1	
(a) ii)	Skor -z = 0.566 / 0.567 $\frac{m-12}{2} = 0.566$ atau $\frac{m-12}{2} = 0.567$ m = 13.13	1 1 1	
(b) i)	${}^{6}C_{0}(\frac{3}{7})^{0}(\frac{4}{7})^{6}$ =0.03482	1 1	**10**
(b) ii)	1- P(X=0)+P(X=1) +P(X=2) @ P(X=3) + P(X = 4) + P(X =5) +P(X=6) $1 - {}^{6}C_{0}(\frac{3}{7})^{0}(\frac{4}{7})^{6} - {}^{6}C_{1}(\frac{3}{7})^{1}(\frac{4}{7})^{5} - {}^{6}C_{2}(\frac{3}{7})^{2}(\frac{4}{7})^{4}$ or ${}^{6}C_{3}(\frac{3}{7})^{3}(\frac{4}{7})^{3} + {}^{6}C_{4}(\frac{3}{7})^{4}(\frac{4}{7})^{2} + {}^{6}C_{5}(\frac{3}{7})^{5}(\frac{4}{7})^{1} + {}^{6}C_{6}(\frac{3}{7})^{6}(\frac{4}{7})^{0}$ *=0.5147@ 0.5148*	1 1 1 1	
12 (a)	$56°35'$ $\frac{BD}{\sin 76°25'} = \frac{10.2}{\sin 56°35'}$ 11.88	1 1 1	
(b)	$8.4^2 = 10^2 + 11.88^2 - 2(10)(11.88)\,kos\angle ADB$ 44.12	1 1	

(c)	 $\angle B'C'D' = 103°35'$ **or equivalent**	1 1	**10**
(d)	$A_1 = \frac{1}{2}(10)(11.88)\sin 44.12°$ *or* $A_2 = \frac{1}{2}(11.88)(10.2)\sin 47°$ $A_1 + A_2 = 41.35 + 44.31$ 85.66	1 1 1	
13 (a)	$x = \frac{12}{8} \times 100$ *or* $\frac{4}{y} \times 100 = 80$ $x = 150 \qquad y = 5$	1 1,1	**10**
(b)	$\frac{z+1}{z} \times 100 = 140$ OR $\frac{z}{z-1} \times 100 = 140$ Harga pada tahun 2012 = 3.50	1 1	
(c) i)	$\frac{150(3.85) + 140(3.25) + 125(0.7) + 80(2.2)}{3.85 + 3.25 + 0.7 + 2.2}$ 129.6 Menaik/ increase 29.6%	1 1 1	
(c) ii)	$\frac{P_{2012}}{4072} \times 100 = 129.6$ dan $*P_{2012} \times 115\%$ 6068.91 OR	1 1	

	$I_{2013/2011}=\frac{129.6\times115}{100}$ 6068.91	 1 1	
14 (a)	22	1	**10**
	$-8t^2+8t+10=0$ atau $6t^2-9t-12=0$	1	
	$t=1.7247\ atau\ t=-0.7247\ (diabaikan\ kerana\ t>0)$ or $t=2.3508\ atau\ t=-0.8508\ (diabaikan\ kerana\ t>0)$	1	
	Zarah Q	1	
(b)	$6t^2-9t-12=\ ^*(-8t^2+8t+10\ )$	1	
	$r=2$ atau $-0.7857\ (diabaikan\ kerana\ t>0)$	1	
(c)	$(8t-8t^2+10)-(6t^2-9t-12)\ \ atau\ 17t-14t^2+22$	1	
	$17-28t=0$	1	
	$17(0.6071)-14(0.6071)^2+22$ or equivalent	1	
	$27.16m$	1	
15 **(a)**	$x+y\leq90$	1	**10**
	$y\leq2x$	1	
	$100x+120y\geq6\ 000$ or equivalent	1	
(b)	Graf (Rujuk Lampiran)		
	1 garis dilukis betul	1	
	Semua garis dilukis betul	1	
	Kawasan R betul	1	
(c) i)	36	1	
ii)	(30, 60)	1	
	100(30) + 120(60)	1	
	RM 2 040	1	


$\frac{P-200}{R}$
2
1
0
2
4
6
8
10
R
-1
-2
-3
-4
-5


y
x
0
10
20
30
40
50
60
70
80
90
y = 2x
x + y = 90
R
100x +120y = 6 000