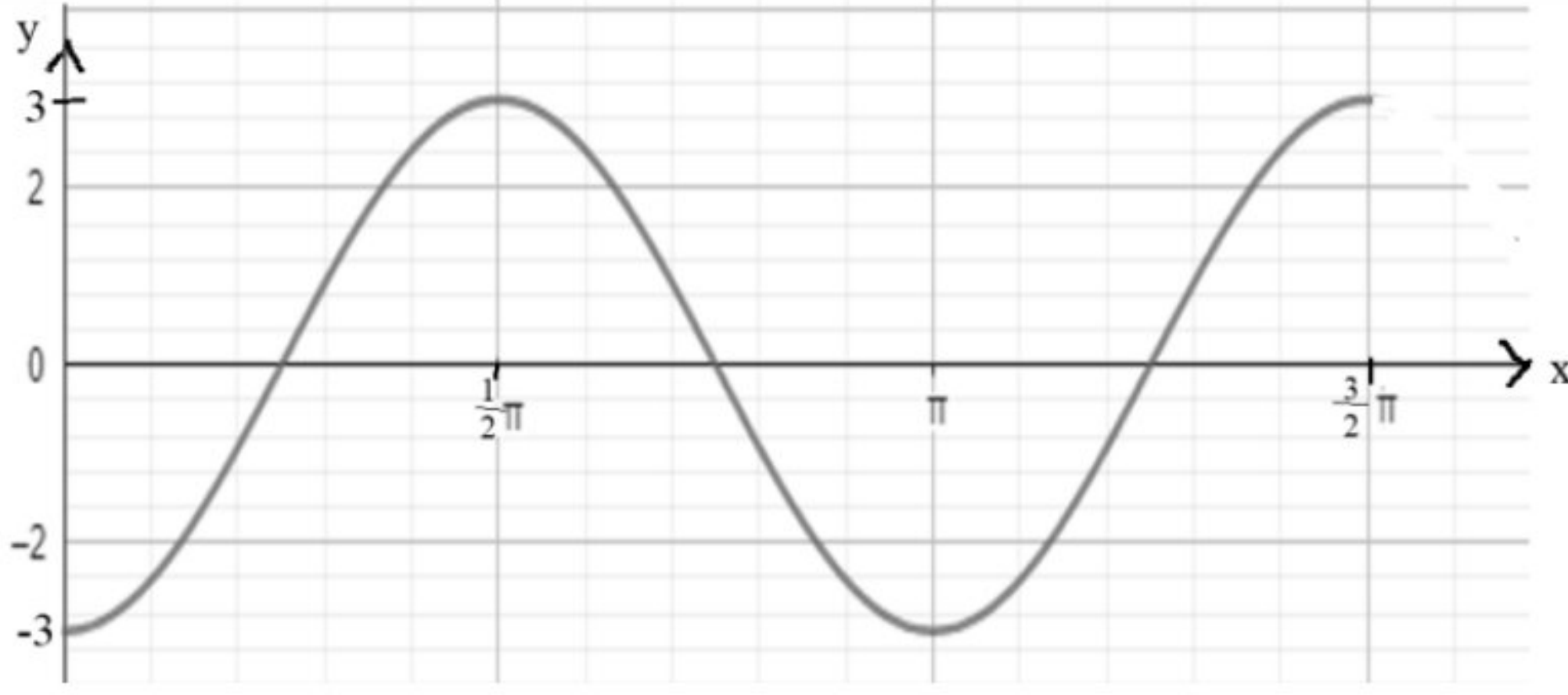
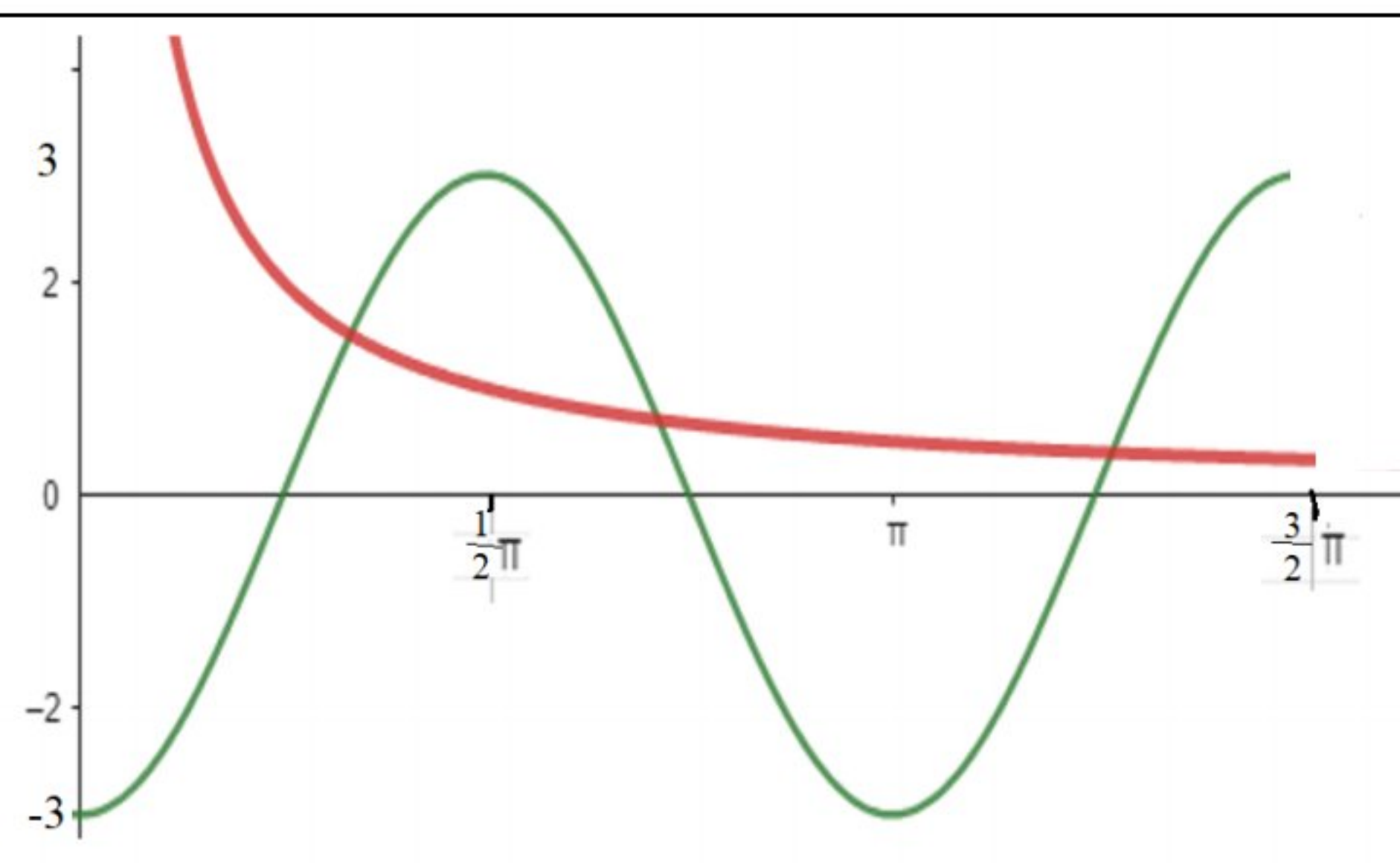


PERATURAN PEMARKAHAN UJIAN DIAGNOSTIK 3 TINGKATAN 5
MATEMATIK TAMBAHAN
(KERTAS 1 / 2023)

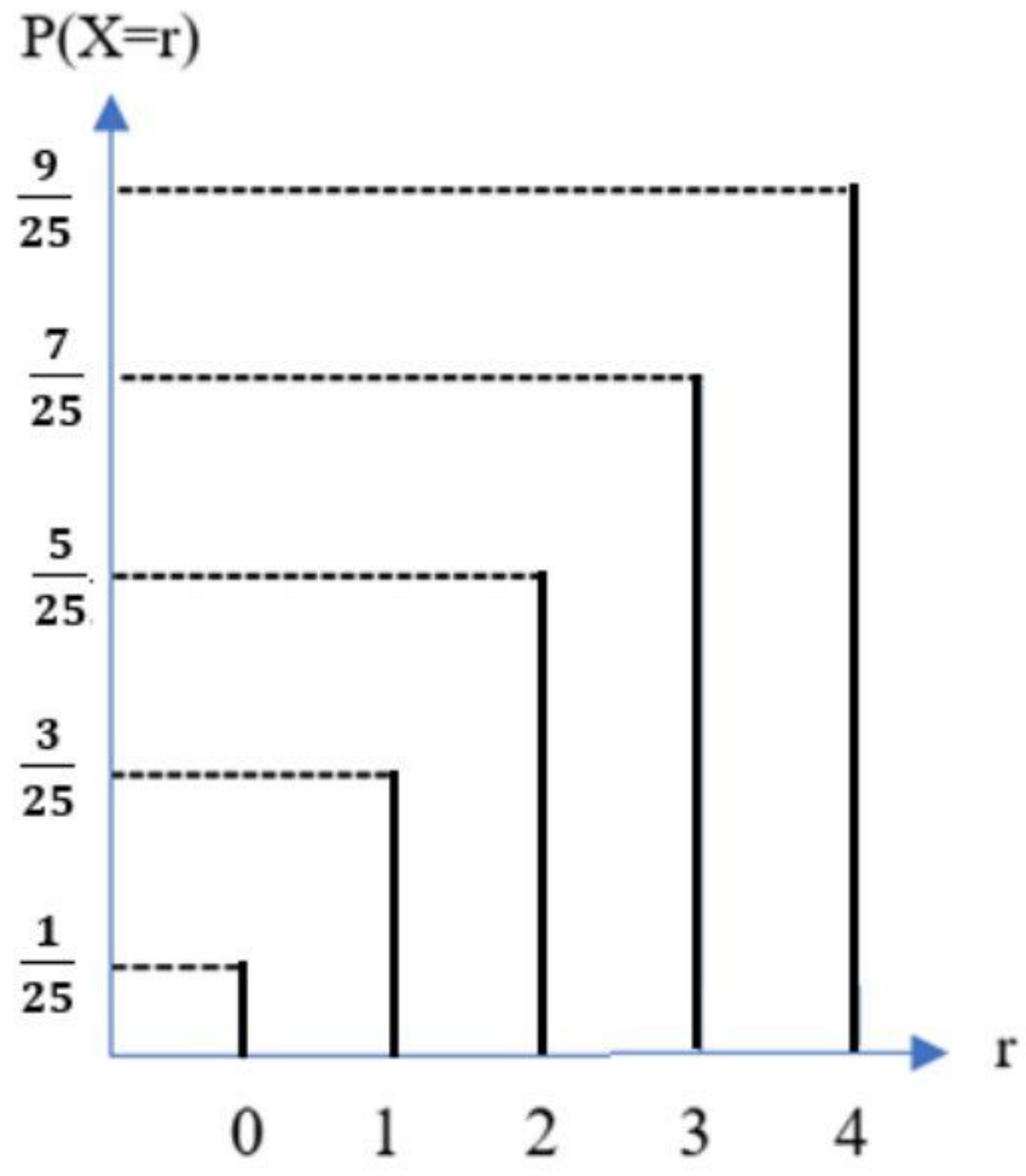
No.	Solutions and marking scheme	Sub Marks	Total Marks	
1	(a)	$\tan \theta_1 = \tan \theta_2$ $m_1 = m_2$ shown	1 1	5
	(b)	$m_{PQ} = \frac{-2-1}{1-(-6)}$ or $m_{RS} = \frac{h-5}{-3-0}$ $\frac{-2-1}{1-(-6)} \times \frac{h-5}{-3-0} = -1$ $h = -2$	1 1 1	
2	(a)	$\frac{L}{\pi j^2} = \frac{\theta}{2\pi}$ $L = \frac{1}{2} j^2 \theta$	1 1	5
	(b)	$\frac{1}{2} \times 6^2 \times \left(\frac{2\pi}{3}\right)$ atau $\frac{1}{2} \times 6 \times 6 \sin 120^\circ$ $\left[\frac{1}{2} \times 6^2 \times \left(\frac{2\pi}{3}\right) - \frac{1}{2} \times 6 \times 6 \sin 120^\circ\right] \times 3$ $L = 36\pi - 27\sqrt{3}$	1 1 1	
3	(a)	$(2 - m)^2 - 4(2)(2) < 0$ $(m + 2)(m - 6) < 0$ $-2 < m < 6$	1 1 1	6
	(b) (i)	$-5 \left(x^2 - 6x + \left(-\frac{6}{2}\right)^2 - \left(-\frac{6}{2}\right)^2 \right)$ 3	1 1	
	(ii)	45	1	

4. (a)	Penyelesaian tak terhingga ialah garis-garis/satah-satah bersilang pada satu garis lurus manakala tiada penyelesaian ialah garis-garis/satah-satah tidak bersilang pada mana-mana titik.	1	
(b)	<u>Alternatif A</u> $y = 1 + 3z$ atau setara $x + (1 + 3z) + z = 2$ atau setara $2(1 - 4z) + (1 + 3z) + 5z = 0$ atau setara $3 = 0$ dan pernyataan palsu, dan tiada penyelesaian atau setara ATAU $3 \neq 0$ dan tiada penyelesaian. <u>Alternatif B</u> $2x + 2y + 2z = 4$ $y - 3z = 4$ $0 = 3$ dan pernyataan palsu atau $0 \neq 3$ Tiada penyelesaian	1 1 1 1 1 1 1 1	5
5 (a)	$4^{4x+3} = 4^x$ dan $4x + 3 = x$ atau $2^{4(2x)+6} = 2^{2x}$ dan $4(2x) + 6 = 2x$ $x = -1$	1 1	
(b)	$\frac{\log_3 k}{\log_3 9}$ $\log_3 p^2 k = 6$ $p^2 k = 729$ atau setara	1 1 1	5

10.	(a)	$42 + 6\sqrt{h} + 28\sqrt{h} + 4h$ $42 + 34\sqrt{h} + 4h$	1 1	5
	(b)	$\frac{1}{2}[(8 - 2\sqrt{h}) + (6 + 4\sqrt{h})][\frac{1}{2}(6 + 4\sqrt{h})] = 27 + 17\sqrt{h}$ $21 + 2h = 27$ $h = 3$	1 1 1	
11.	(a)	$m = -4$ $ -4 + 2n = 0$ $n = 2$	1 1 1	6
	(b)	$0 \leq f(x) \leq 8$	1	
	(c)	$-4 + 2x \geq 2$ dan $-4 + 2x \leq -2$ $x \geq 3$ dan $x \leq 1$	1 1	
12.	(a)	$\frac{n(n-1)!}{(n-1)!}$ n	1 1	6
	(b) (i)	$(5-1)! \times 2$ 48	1 1	
		(ii)	$(6-1)! - 48$ 72	

<p>13. (a)</p>	 <p><i>Bentuk kos at least 1 cycle</i></p> <p><i>Amplitude</i> <i>Min = -3</i> <i>Max = 3</i></p> <p><i>Cycles</i> $1\frac{1}{2}$ cycles & -ve cos graph</p>	<p>1</p> <p>1</p> <p>1</p>	
<p>(b)</p>	 <p>$y = \frac{\pi}{2x}$</p> <p>Reciprocal graph</p> <p>No of solutions = 3</p>	<p>1</p> <p>1</p> <p>1</p>	
<p>(c)</p>	<p>$\frac{3p}{2} = 3$ or $\frac{3p}{2} = -3$</p> <p>$p = 2$ and $p = -2$</p>	<p>1</p> <p>1</p>	<p>8</p>

14. (a)	$n \rightarrow \infty$, maka $r^n \approx 0$ dan guna $S_n = \frac{a(1-r^n)}{1-r}$ $S_\infty = \frac{a(1-0)}{1-r}$ $S_\infty = \frac{a}{1-r}, r < 1$	1	
(b) (i)	$3\left(\frac{1}{2}\right)^{5-1}$ atau kaedah listing: $3, \frac{3}{2}, \frac{3}{4}, \frac{3}{8}, \frac{3}{16}$ $\frac{3}{16}$ atau $T_5 = \frac{3}{16}$ (kaedah listing)	1	
(ii)	<u>Alternatif 1</u> $a = \frac{1}{8}, r = \frac{32}{1}$ OR $S_\infty = \frac{\frac{1}{8}}{1-\frac{1}{4}}$ dan $\frac{1}{6} \times (6 \times 6)$ 6 <u>Alternatif 2</u> $a = \frac{1}{2} \times 3 \times 3, r = \frac{\frac{1}{2} \times 1.5 \times 1.5}{\frac{1}{2} \times 3 \times 3}$ $S_\infty = \frac{\frac{1}{2} \times 3 \times 3}{1-\frac{1}{4}}$ 6	1, 1 1 1 1, 1 1 1	8

15. (a)	${}^6C_6 p^6 q^{6-6} = \frac{1}{64}$ $p^6 = \frac{1}{64}$ $p = \frac{1}{2}$	1 1 1													
(b) (i)	$m(2(0) + 1) + m(2(1) + 1) + m(2(2) + 1) + m(2(3) + 1) + m(2(4) + 1) = 1$ $m = \frac{1}{25}$	1,1 1													
(c)	<table border="1" data-bbox="571 1071 1602 1234"> <thead> <tr> <th>r</th> <th>0</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>P(X=r)</td> <td>$\frac{1}{25}$</td> <td>$\frac{3}{25}$</td> <td>$\frac{5}{25}$</td> <td>$\frac{7}{25}$</td> <td>$\frac{9}{25}$</td> </tr> </tbody> </table> 	r	0	1	2	3	4	P(X=r)	$\frac{1}{25}$	$\frac{3}{25}$	$\frac{5}{25}$	$\frac{7}{25}$	$\frac{9}{25}$	1 1	8
r	0	1	2	3	4										
P(X=r)	$\frac{1}{25}$	$\frac{3}{25}$	$\frac{5}{25}$	$\frac{7}{25}$	$\frac{9}{25}$										