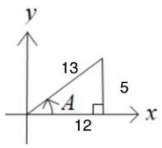
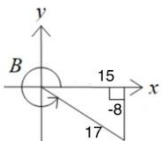
PERATURAN PEMARKAHAN
MATEMATIK TAMBAHAN – KERTAS 1
PERCUBAAN TAHUN 2025
TINGKATAN 5

BAHAGIAN A **[64 MARKAH]**				
Nombor	**Penyelesaian markah**		**Sub Markah**	**Markah Penuh**
1	(a)	$\frac{5}{\sqrt{5}-5}\times\frac{\sqrt{5}+5}{\sqrt{5}+5}$ $\frac{5\left(\sqrt{5}+5\right)}{5-25}$ $\frac{-\left(\sqrt{5}+5\right)}{4}$	K1 N1	**5**
	(b)	$2^{2(2x+y)} = 7 + (2^4)^x$ $2^{4x+2y} = 7 + 2^{4x}$ $2^{4x} \times (2^y)^2 = 7 + 2^{4x}$ $rs^2 = 7 + r$ $s^2 = \frac{7+r}{r}$ $s^2 - 1 = \frac{7}{r}$ $r = \frac{7}{s^2-1}$	K1 K1 N1	
2	(a)	$3(k-1)+2c = 5c$ $3k-3 = 3c$ $c = k-1$	K1 N1	**5**
	(b)	(i) $3x-2c = 3x$ $c = 0$	K1	
		(ii) $f(c-1) = c+1$ $3(c-1)+c = c+1$ $c = 1$	K1 N1	
3	(a)	Pelaburan tahun 2021/ *Investment in the year 2021* $= \frac{108}{100} \times 1500 = 1\,620$ Nisbah/ *Ratio* $= \frac{1620}{1500} = \frac{27}{25}$	K1 N1	**5**

		$= 27 : 25$		
	(b)	$T_n > 2\,500$ $(1\,500)\left(\frac{27}{25}\right)^{n-1} > 2\,500$ $\left(\frac{27}{25}\right)^{n-1} > \frac{2\,500}{1500}$ $(n-1)\log\frac{27}{25} > \log\left(\frac{5}{3}\right)$ $n - 1 > 6.647$ $n > 7.647$ $n = 8$ Tahun/ year of 2028	P1 K1 N1	
4	(a)	$y = 2x(3-x)^4$ $\frac{dy}{dx} = (2x)\frac{d}{dx}(3-x)^4 + (3-x)^4\frac{d}{dx}(2x)$ $= (2x)(4)(3-x)^3(-1) + (3-x)^4(2)$ $= -8x(3-x)^3 + 2(3-x)^4$ Apabila/ *When* $x = 2$ $\frac{dy}{dx} = -8(2)(3-2)^3 + 2(3-2)^4 = -14$ Kecerunan tangen kepada lengkung di titik Q(2,4) ialah -14. *Gradient of the tangent to the curve at point Q(2,4) is -14.*	P1 K1 K1 N1	**7**
	(b)	Kecerunan normal kepada lengkung di titik Q *Gradient of the normal to the curve at point Q* $= -\frac{1}{(-14)} = \frac{1}{14}$ Persamaan normal di titik Q ialah *The equation of the normal at point Q is* $y - 4 = \frac{1}{14}(x-2)$ $14y - 56 = x - 2$ $14y = x + 54$	K1 K1 N1	
5	(a)	${}^7P_5 = 2520$	N1	**4**
		${}^1P_1 \times {}^6P_4$ $= 360$	P1, K1 N1	

6	(a)	$p = 0.85,\ \ q = 0.15,\ \ P(X = n) = 0.1038$ $^{n}C_{n}(0.85)^{n}(0.15)^{0} = 0.1038$ $(0.85)^{n} = 0.1038$ $n \log 0.85 = \log 0.1038$ $n = \dfrac{\log 0.1038}{\log 0.85} \approx 13.9$ $n = 14$	K1 K1 N1	**6**
	(b)	$p = 0.85,\ \ q = 0.15$ $P(X < 3) = P(X = 0) + P(X = 1) + P(X = 2)$ $^{14}C_{0}(0.85)^{0}(0.15)^{14} + {}^{14}C_{1}(0.85)^{1}(0.15)^{13} +$ $^{14}C_{2}(0.85)^{2}(0.15)^{12} = 8.765 \times 10^{-9}$	P1 K1 N1	
7	Andaikan bola disepak dari titik $O(0,0)$. *Suppose the ball is kicked from the point* $O(0,0)$. Berdasarkan rajah, paksi simetri, $x = \frac{8}{2} = 4$. *Based on the diagram, axis of symmetry,* $x = \frac{8}{2} = 4$. Titik maksimum/ *maximum point* $= (4, 2)$ Apabila bola jatuh ke tanah/ *When the ball touches the ground,* $(8, 0)$ $0 = a(8 - 4)^{2} + 2$ $a = -\dfrac{1}{8}$ $\therefore y = -\dfrac{1}{8}(x - 4)^{2} + 2$		P1 K1 K1 N1	**4**

8		$\sin A = \frac{5}{13}$ @ $\text{kos}\, A = \frac{12}{13}$ @  $\sin B = \frac{-8}{17}$ @ $\text{kos}\, B = \frac{15}{17}$ @ 	N1	
	(a)	$\left(\frac{5}{13}\right)\left(\frac{15}{17}\right) + \left(\frac{12}{13}\right)\left(-\frac{8}{17}\right)$ $= \frac{-21}{221}$	K1 N1	**5**
	(c)	$\frac{\left(\frac{5}{12}\right) - \left(-\frac{8}{15}\right)}{1 + \left(\frac{5}{12}\right)\left(-\frac{8}{15}\right)}$ $= \frac{171}{140}$	K1 N1	
9	(a)	$\overrightarrow{OS} = \underset{\sim}{i} + \underset{\sim}{j}$ $\overrightarrow{OT} = 3\underset{\sim}{i} - 2\underset{\sim}{j}$ $\overrightarrow{OU} = 6\underset{\sim}{i} + k\underset{\sim}{j}$ $\overrightarrow{ST} = \overrightarrow{SO} + \overrightarrow{OT}$ $= -\left(\underset{\sim}{i} + \underset{\sim}{j}\right) + (3\underset{\sim}{i} - 2\underset{\sim}{j})$ $= -(1+3)\underset{\sim}{i} + (-1-2)\underset{\sim}{j}$ $= 2\underset{\sim}{i} - 3\underset{\sim}{j}$	K1 N1	**5**
	(b)	$\overrightarrow{TU} = \overrightarrow{TO} + \overrightarrow{OU}$ $= -(3\underset{\sim}{i} - 2\underset{\sim}{j}) + (6\underset{\sim}{i} + k\underset{\sim}{j})$ $= 3\underset{\sim}{i} + (2+k)\underset{\sim}{j}$ $2 + k = 0$ $k = -2$	K1 K1 N1	
10	(a)	$\left[\frac{2x^2}{2} - 6x\right]_1^m = -4$ $m^2 - 6m - (1-6) + 4 = 0$ $m^2 - 6m + 9 = 0$ $(m-3)(m-3) = 0$ $m = 3$	K1 N1 N1	**6**

	(b)	pintasan-$y = 6$, pintasan-$x = -2$ kecerunan, $m = -\frac{6}{(-2)} = 3$ $(y - x) = 3x^2 + 6$ $y = 3x^2 + x + 6$	K1 K1 N1	
11	(a)	$2x + 6 = -\frac{x}{2} + 10$ $2x + \frac{x}{2} = 10 - 6$ $x = \frac{8}{5}$ Apabila/ *When* $x = \frac{8}{5}$ $y = 2\left(\frac{8}{5}\right) + 6 = \frac{46}{5}$ Koordinat/ Coordinate = $\left(\frac{8}{5}, \frac{46}{5}\right)$	 K1 N1	**6**
	(b)	$y = 2(10) + 6$ $y = 26$ $N(10, 26)$ Jarak/ *Distance* = $\sqrt{\left(10 - \frac{8}{5}\right)^2 + \left(26 - \frac{46}{5}\right)^2}$ $= 18.78$	K1 K1 K1 N1	
12	(a)	$\frac{dh}{dx} = 3$ dan/ *and* $\frac{dk}{dx} = 2x$ Apabila/ *When* $x = 2$, $\frac{dk}{dx} = 2(2) = 4$ $\frac{dk}{dh} = \frac{dk}{dx} \times \frac{dx}{dh}$ $= 4 \times \frac{1}{3} = \frac{4}{3}$	K1 K1 N1	

	(b)	Jumlah luas permukaan/ *total area surface* $2x^2 + 4xh = 216$ $h = \frac{216 - 2x^2}{4x}$ Isipadu/ *volume* $v = x^2h$ $v = x^2\left(\frac{216 - 2x^2}{4x}\right)$ $v = \frac{216x - 2x^3}{4}$ Isipadu maksimum/ *maximum volume* $\frac{dv}{dx} = 0$ $54 - \frac{3}{2}x^2 = 0$ $x = 6$	K1 K1 N1	**6**

BAHAGIAN B [16 MARKAH]				
13	(a)	(i) $m = -1$	P1	8
	(b)	$\|2x - 3\| - 1 = 0$ $x = 1, \quad x = 2$	K1 N1 N1	
	(c)	$\|2x - 3\| \leq 2$ dan/ *and* $\|2x - 3\| \geq -2$ $\frac{1}{2} \leq x \leq \frac{5}{2}$	K1 N1	
	(d)	$\|2x - 3\| - 1 = x$ $x = 4, \quad x = \frac{2}{3}$	K1 N1	
14	(a)	Apabila/ *When* $x = 2$, $y = 36 - 2^2 = 32$ Koordinat/ *Coordinate* $F(2, 32)$. $\frac{dy}{dx} = -2x$ Apabila/ *When* $x = 2$, $\frac{dy}{dx} = -2(2) = -4$ Persamaan garis lurus EFG/ *Equation of the straight line EFG* $y - 32 = -4(x - 2)$ $y = -4x + 40$	K1 K1 N1	**8**
		Apabila/ *When* $y = 0, \ x = p$ $0 = -4(p) + 40$ $p = 10$	N1	

	(b)	Luas rantau berlorek/ *the area of shaded region* $= \left[\frac{1}{2} \times (10-2) \times 32\right] - \int_2^6 (36 - x^2)dx$ $= 128 - \left[36x - \frac{x^3}{3}\right]_2^6$ $= 128 - 74\frac{2}{3}$ $= 53\frac{1}{3}$ unit^2	K1 K1 N1	
15	(a)	$-2 \times m_{BC} = -1$ atau/ *or* $(-2)\left(-\frac{3}{k}\right) = -1$ -6	K1 N1	**8**
	(b)	$(-6,15)$	N1	
	(c)	$\frac{1}{2}\|[-6(3) + 0(0) + (-6)(15)] - [0(15) + (-6)(3) + (-6)(0)]\|$ 45	K1 N1	
	(d)	$\sqrt{(x-0)^2 + (y-3)^2}$ atau/ *or* $\sqrt{(-6-0)^2 + (0-3)^2}$ $\sqrt{(x-0)^2 + (y-3)^2} = \sqrt{(-6-0)^2 + (0-3)^2}$ atau/ *or* $\sqrt{(x-0)^2 + (y-3)^2} = \sqrt{45}$ atau/ *or* $x^2 + y^2 - 6y - 36 = 0$	K1 K1 N1	

PERATURAN PEMARKAHAN TAMAT