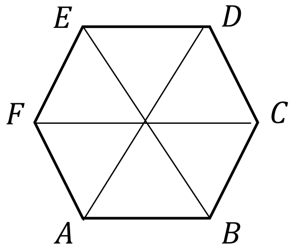
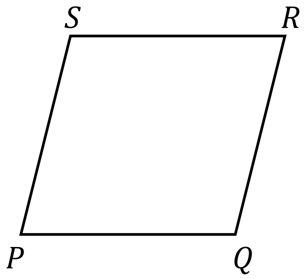
★ ★

Modul Pintas Tingkatan 5

Peperiksaan Percubaan SPM 2018

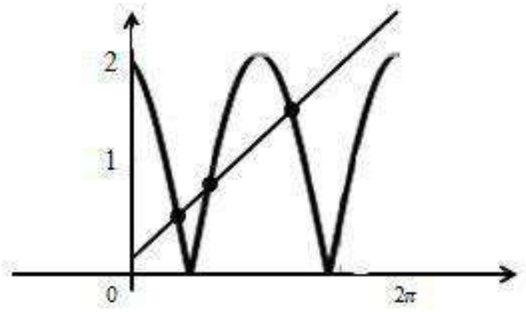
Skema Jawapan Matematik Tambahan

Kertas 2   3472/2

No				
1	(a)			
		$OG = OA + AG$ or $CD = CG + GD$	K1	
	(i) (ii)	$a - b + c$ $a - 2b + c$	N1 N1	
	(b)			
		$p + q - (2p + 3q) + (4p - q)$	K1	
		$-(p + q) + 5p = 4p - q = OR$ $\because PT = OR \Longrightarrow PT \parallel OR$ and $\lvert PT\rvert = \lvert OR\rvert$	K1	
		Since PT is parallel to OR, and $\lvert PT\rvert = \lvert OR\rvert$, therefore $OPTR$ is a parallelogram.	N1	
				6
2	(a) (i)	$240(1.06)^{20}$ 770	K1 N1	
	(ii)	$240(1.06)^{n} = 2500$	K1	
		∴ The year in which the population first reached 2500 is 2040.	N1	

	(b)	$\log_{10}q = \log_{10}10 + \log_{10}2 - \log_{10}5^2$ $q = \frac{4}{5}$	K1 N1	6
3		$2(30-2x)+2(y-2)=84$ *or* $(30-2x)(y-2)=416$ $y=14+2x$ $30(14+2x)+4x-2x(14+2x)=476$ $x=\frac{-9\pm\sqrt{9^2-4(-1)(-14)}}{2(-1)}$ $x=7, \quad 2$ $y=\ 28,\ 18$	P1 P1 K1 K1 N1 N1	
				6
4	(a)	$y=(1+x)(1-x)$ When $y=0, (1+x)(1-x)=0$ $\therefore x = 1$ or -1 $\therefore$ the coordinates of the points are $(1,0)$ and $(-1,0)$	N1N1	
	(b)	$\left[x-\frac{x^3}{3}\right]_{-1}^{1}$ $\left(1-\frac{1}{3}\right)-(-1+\frac{1}{3})$ $\frac{4}{3}unit^2$	K1 K1 N1	
	(c)	$\pi\left[x-\frac{2x^3}{3}+\frac{x^5}{5}\right]_{-1}^{1}$ $\pi\left[(1)-\frac{2(1)^3}{3}+\frac{(1)^5}{5}\right]-\pi\left[(-1)-\frac{2(-1)^3}{3}+\frac{(-1)^5}{5}\right]$ $\frac{14}{15}\pi$	K1 K1 N1	
				8
5	(a)	$(i) \quad T_1 = a = 0.79$, $\quad d = 0.025$ $1.24 = 0.79 + (n-1)0.025$ $(ii) \quad n = 19$	P1 K1 N1	
	(b)	$\frac{19}{2}[2\times 0.79 + 18\times 0.025]$ 19.285 m	K1 N1	

<table>
<tr><td></td><td>(c)</td><td>$\frac{19}{2}[2.16 + 3.24]$
$51.3\ zed$</td><td>K1

N1</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>7</td></tr>
<tr><td>6</td><td>(a)</td><td>

$y = \frac{4x}{3\pi}$
Sketch the straight line, correct axis or y intercept
the number of solutions of is 3.</td><td>P1
P1
P1
P1

N1
K1
N1</td><td>7</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>7</td><td>(a)
(i)</td><td>$60^\circ \times \frac{3.142}{180^\circ} \times 10$
$10.47\ cm$</td><td>K1

N1</td><td></td></tr>
<tr><td></td><td>(ii)</td><td>$\frac{1}{2} \times 10^2 \times \frac{3.142}{3} - \frac{1}{2} \times 10^2 sin60^\circ$
$Area\ of\ segment\ ACB = 9.07cm^2$</td><td>KIK1K1

N1</td><td></td></tr>
<tr><td></td><td>(b)</td><td>$AE = 5\ cm$
Area of $\Delta ABD = \frac{1}{2} \times 10.5 \times 5$
Area of the shaded region $ABCD = 26.25 - 9.1$
$= 17.2cm^2$</td><td>P1
K1
K1
N1</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td>10</td></tr>
<tr><td>8</td><td>(a)</td><td><table><tr><td>$\log_{10} p$</td><td>0.30</td><td>0.60</td><td>0.78</td><td>0.90</td><td>1.00</td></tr><tr><td>$\log_{10} v$</td><td>0.35</td><td>0.50</td><td>0.59</td><td>0.65</td><td>0.70</td></tr></table>
Refer to graph</td><td>N1

N1

3m</td><td></td></tr>
<tr><td></td><td>(b)
(i)

(ii)</td><td>$m =$ 0.5 or c= 0.2
$\log_{10} v = 0.5 \log_{10} p + 0.2$

$v = 1.585 p^{\frac{1}{2}}$</td><td>P1
K1

N2</td><td></td></tr>
</table>

	(c)	$p = 6.371$	N1	
				10
9	(a)	$p^2 = 4x$ $\therefore P$ is $(\frac{1}{4}p^2, 0)$ Area of $\Delta PQR\ (A) = \frac{1}{2} \times (\frac{1}{4}p^2 - 2) \times p$ $(\frac{1}{8}p^3 - p)$ sq. units $\frac{dA}{dp} = \frac{3p^2}{8} - 1$	K1 N1 K1 N1	
	(b) (i)	$\frac{dA}{dt} = \frac{dA}{dp} \times \frac{dp}{dt}$ $\frac{dA}{dt} = (\frac{3p^2}{8} - 1) \times 0.2$ When $p = 6, \frac{dA}{dt} = \left(\frac{3}{8} \times 6^2 - 1\right) \times 0.2$ second $\therefore A$ is increasing at the rate of 2.5 sq. units per second.	K1 K1 N1	
	(ii)	$\delta p = k$ $\delta A = \frac{dA}{dp} \cdot \delta p$ $\delta A = (\frac{3}{8} \times 6^2 - 1) \cdot k$ $\delta A = 12.5k$ sq. units.	P1 K1 N1	
				10
10	(a) (i)	${}^7C_3\left(\frac{1}{5}\right)^3\left(\frac{4}{5}\right)^4$ 0·1147	K1 N1	
	(ii)	${}^7C_r\left(\frac{4}{5}\right)^r\left(\frac{1}{5}\right)^{7-r}$ Use $P(X=6)+P(X=7)$ $= {}^7C_6\left(\frac{4}{5}\right)^6\left(\frac{1}{5}\right)^1 + {}^7C_7\left(\frac{4}{5}\right)^7\left(\frac{1}{5}\right)^0$ 0·5767	P1 K1 N1	
	(b) (i)	$\frac{300 - 700}{200}$ 0·0228	K1 N1	

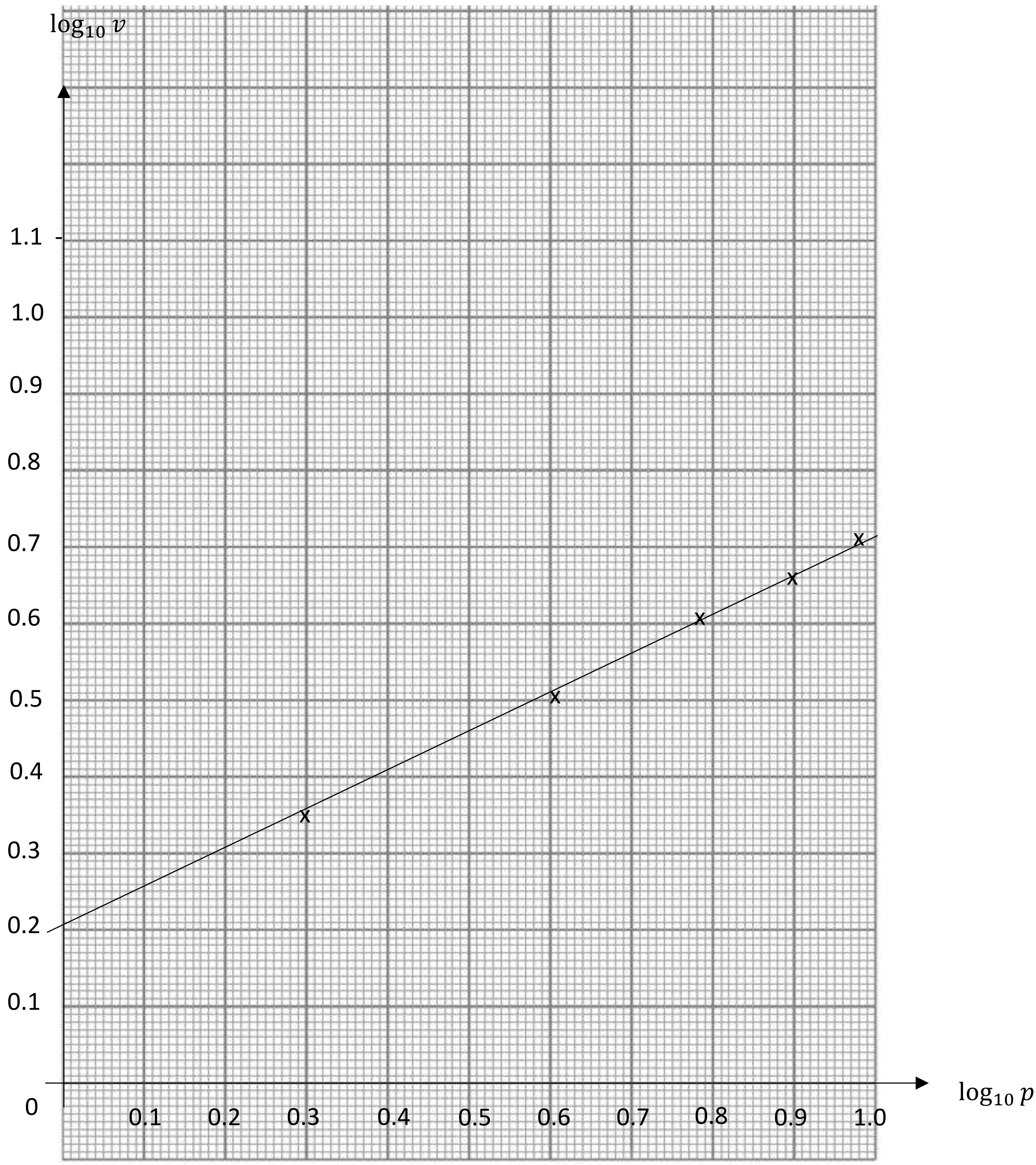
	(ii) (iii)	$P\left(\frac{300-700}{200} < Z < \frac{800-700}{200}\right)$ 0.6687 $0.6687n = 983$ $n = 1470$	P1 K1 N1	
				10
11	(a)	Gradient of $OA = 2$ ∴Gradient of AB is $-\frac{1}{2}$ Equation of AB is $y - 8 = -\frac{1}{2}(x - 4)$ $2y + x = 20$ At $B, x = 0$, $2y = 20$ $y = 10$ ∴ B is $(0,10)$	K 1 N1 N1	
	(b) (i)	Since OC is parallel to $y + 3x = 5$, ∴gradient of OC is $y - 0 = -3(x - 0)$ $y = -3x$ Mid-point of $AB = \left(\frac{4+0}{2}, \frac{10+8}{2}\right) = (2,9)$ Equation of the perpendicular bisector of AB is $y - 9 = 2(x - 2)$ $y = 2x + 5$ $2x + 5 = -3x$ $x = -1$ $y = -3(-1) = 3$ ∴ the coordinates of C is $(-1,3)$	K1 P1 K1 K1 N1	
	(ii)	Area of $OABC = \frac{1}{2}\begin{vmatrix} 0 & 4 & 0 & -1 & 0 \\ 0 & 8 & 10 & 3 & 0 \end{vmatrix}$ $\Delta OABC = \frac{1}{2}[(0 + 40 + 0 + 0) - (0 + 0 - 10 + 0)]$ $\Delta OABC = 25$ sq. units.	K1 N1	
				10
12	(a)	$x = \frac{100}{110} \times 5.50 \ \ or \ \ \frac{140}{100} \times 3.50$ (i) RM 5.00 (ii) RM 4.90	K1 N1 N1	
	(b)	$\frac{110(2) + 120(4) + x(3) + 140(1)}{10} = 115.5$ $x = 105$	K1 K1 N1	

	(c)	$\bar{I} = \frac{121(2) + 120(4) + 99.75(3) + 140(1)}{10}$ 116.1	K1 N1	
	(d)	$x = \frac{116.13}{100} \times 15$ RM 17.42	K1 N1	
				10
13	(a)	I : x + y ≥ 20 II : x ≤ 2y III : 15x + 8y ≥ 25	N1 N1 N1	
	(b)	Refer to Graph 13	K1 N1 N1	
	(c)	(10,10) 8(10)+15(10) 200 - *(8(10)+15(10)) RM 20	N1 K1 K1 N1	
				10
14	(a) (i)	$\frac{\sin C}{11.51} = \frac{sin 93.16^{\circ}}{15}$ $C = 50.01^{\circ}$	K1 N1	
	(ii)	79.98^{o} $EC^2 = 9^2 + 9^2 - 2(9)(9)\cos 79.98^{o}$ $EC = 11.57$	P1 K1 N1	
	(iii)	$Area = \frac{1}{2}(11.51)(9)\sin\left(93.16^{o} - *79.98^{o}\right)$ = 11.81	K1 N1	
	(b)	$*79.98^{o} + 93.16^{o}$ $AD^2 = 11.51^2 + 9^2 - 2(11.51)(9)\cos\left(*79.98^{o} + 93.16^{o}\right)$ $AD = 20.47$	P1 K1 N1	
				10
15	(a)	Find t when $v = 0$, $(t-5)(t-1) = 0$ $\int_1^5 v\ dt = \left[\frac{t^3}{3} - 6\left(\frac{t}{2}\right) + 5t\right]_1^5$ $(\frac{1}{3} - 3 + 5)$ - $(\frac{1}{3}(5)^3 - 3(5)^2 + 5(5))$ $\therefore$ the distance $AB = \frac{7}{3} + \frac{25}{3} = \frac{32}{3}$	K1 K1 K1 N1	

	(b)	$\frac{7}{3}+\frac{25}{3}$ <u>OR</u> $\int_0^1 vdt + \left\|\int_0^1 vdt\right\|$ $13\ cm$	K1 N1	
	(c)	$a = 2t - 6$ $t = 3\ s$ $\therefore s = \frac{1}{3}(3)^3 - 3(3)^2 + 5(3)$ $s = -3\ cm$ $\therefore$ the distance $OC = 3\ cm$ the distance $BC = \frac{25}{3} - 3 = \frac{16}{3}\ cm$ $\therefore$ C is nearer to O.	K1 N1 K1 N1	
				10

Question 8

$\log_{10} p$	0.30	0.60	0.78	0.90	1.00
$\log_{10} v$	0.35	0.50	0.59	0.65	0.70



One *straight line drawn correctly	K1
All * straight lines drawn correctly	N1
Correct Region	N1