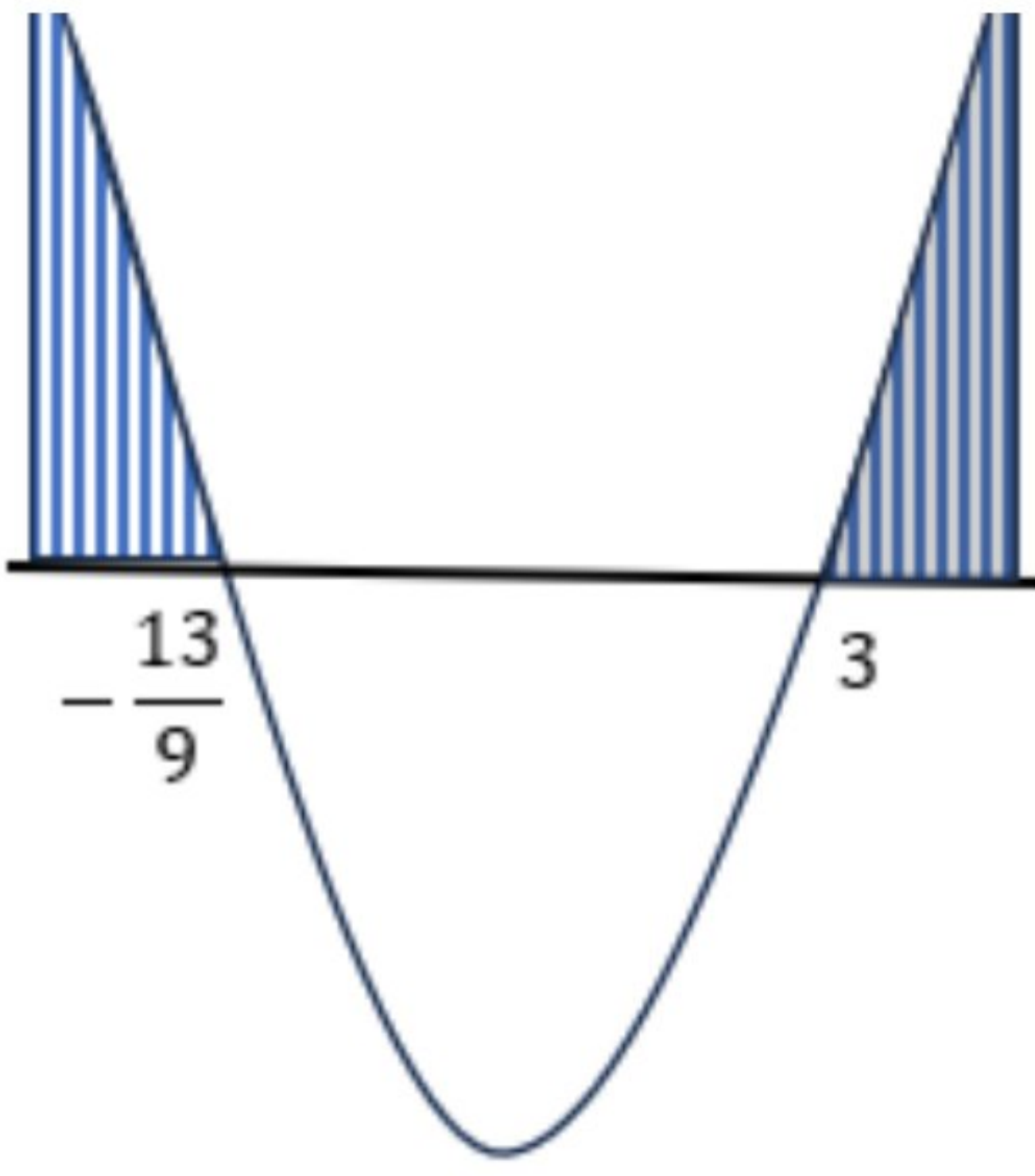


**Peraturan Pemarkahan Ujian Diagnostik 3 Tingkatan 5 Matematik Tambahan
(Kertas 2 / 2023)**

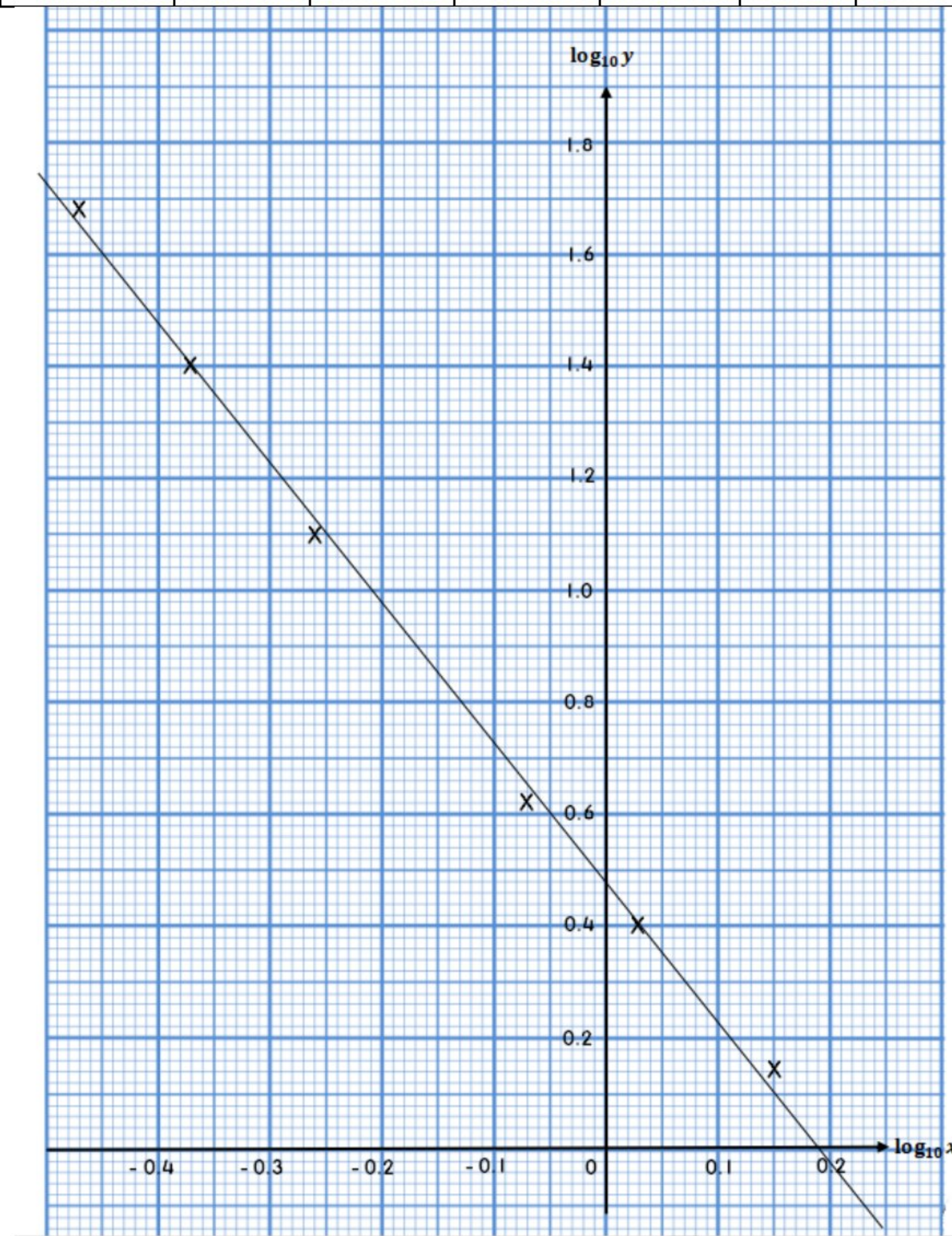
No	Solutions and marking Scheme	Sub marks	Total Marks
1	$2x^2 + 11y^2 + 2x + 2y = 0 \dots\dots 1$ $x - 3y + 1 = 0 \dots\dots 2$ From 2, $x = 3y - 1 \dots\dots 3$ Substitute 3 into 1 $2(3y - 1)^2 + 11y^2 + 2(3y - 1) + 2y = 0$ $29y^2 - 4y = 0$ $y(29y - 4) = 0$ $y = 0$ or $y = \frac{4}{29}$ Substitute y into 3 $x = 3(0) - 1$ or $x = 3(\frac{4}{29}) - 1$ $= -1$ or $= -\frac{17}{29}$ $(-1, 0)$ and $(-\frac{17}{29}, \frac{4}{29})$	1 1 1 1 1	5
2(a) i ii	7 10	1 1	
(b)	$h+k = -\frac{2}{3}$ dan $hk = -2$ $\frac{h}{k} + \frac{k}{h} = \frac{(-\frac{2}{3})^2 - 2(-2)}{-2}$ atau $\frac{h}{k} \times \frac{k}{h} = 1$ $9x^2 + 20x + 9 = 0$ atau setara	1 1 1	
(c)	$(3h - 1)^2 - 4(1)(2h + 10) > 0$  $h > 3$, $h < -\frac{13}{9}$	1 1 1	8

3(a)	Pembahagi dua sama seranjang bagi PQ // perpendicular bisector of PQ	1	
(b) i	<p>Titik tengah AB, $M = (-2,5)$ Titik bergerak $P(x, y)$</p> $BM = \sqrt{(-2 - 1)^2 + (5 - 1)^2} \text{ atau } AM = \sqrt{(-5 + 2)^2 + (9 - 5)^2}$ $PM = \sqrt{(x + 2)^2 + (y - 5)^2}$ <p>Gunakan $PM = AM$ atau BM</p> $\sqrt{(x + 2)^2 + (y - 5)^2} = 5$ $x^2 + y^2 + 4x - 10y + 4 = 0$ <p style="text-align: center;">OR</p> $\left(\frac{y - 9}{x + 5}\right) \text{ or } \left(\frac{y - 1}{x - 1}\right)$ $\left(\frac{y - 9}{x + 5}\right) \left(\frac{y - 1}{x - 1}\right) = -1$ $y^2 - 10y + 9 = -x^2 - 4x + 5$ $x^2 + y^2 + 4x - 10y + 4 = 0$	1 1 1 1	8
(b) ii	$y^2 - 10y + 4 = 0$ $y = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(1)(4)}}{2(1)}$ <p>Pintasan $-y = 9.583$ dan $y = 0.4174$</p>	1 1 1	
4 (a) (i)	$y + \partial y = 2\sqrt{x + \partial x}$ $\partial y = 2\sqrt{x + \partial x} - 2\sqrt{x}$ $\partial y = (2\sqrt{x + \partial x} - 2\sqrt{x}) \times \frac{(2\sqrt{x + \partial x} + 2\sqrt{x})}{(2\sqrt{x + \partial x} + 2\sqrt{x})}$ $= \frac{4\partial x}{(2\sqrt{x + \partial x} + 2\sqrt{x})}$ $\text{had}_{\partial x \rightarrow 0} \frac{\partial y}{\partial x} = \frac{4}{(2\sqrt{x + \partial x} + 2\sqrt{x})}$ $\frac{dy}{dx} = \frac{1}{\sqrt{x}}$	1 1 1	8
(a) ii	$\partial y = \frac{1}{\sqrt{25}} \times (0.04)$ $\partial y = 0.008$	1 1	
(b)	$\frac{\partial V}{\partial j} = 2\pi j^2$ $-1.02\pi = 2\pi j^2 \times (-0.1)$ $j = 2.258 \text{ cm}$	1 1 1	

5 (a)	1.746	1	
(b)	$6 \times (2\pi - 1.746)$ 27.23	1 1	
(c)	$Luas\ sektor\ AOB, A_1 = \frac{1}{2}(6)^2 \left(130 \times \frac{\pi}{180}\right)$ $Luas\ segitiga\ AOB, A_2 = \frac{1}{2} \times 6 \times 6 \times \sin 130^\circ$ $(A_1 - A_2) \times 2$ 54.11 OR other valid method	1 1 1 1	
6(a)	$\frac{\cos(A+B)}{\sin A \sin B} = \frac{\cos A \cos B - \sin A \sin B}{\sin A \sin B}$ $= \frac{\cos A \cos B}{\sin A \sin B} - \frac{\sin A \sin B}{\sin A \sin B}$ $= \cot A \cot B - 1$	1 1	
(b)	$\tan(45^\circ + x) = 4 \tan(45^\circ - x)$ $\frac{\tan 45^\circ + \tan x}{1 - \tan 45^\circ \tan x} = 4 \left(\frac{\tan 45^\circ - \tan x}{1 + \tan 45^\circ \tan x} \right)$ $\frac{1 + \tan x}{1 - \tan x} = 4 \left(\frac{1 - \tan x}{1 + \tan x} \right)$ $(3 \tan x - 1)(\tan x - 3) = 0$ $\tan x = \frac{1}{3} \text{ atau } \tan x = 3$ $x = 18.43^\circ, 71.57^\circ, 198.43^\circ, 251.57^\circ$	1 1 1 1	
7(a)	$\frac{7}{2}[2a + (7 - 1)d] = 511$ $\frac{19}{2}[2a + (19 - 1)d] - 511 = -150$ Solve the equation by using substitution method or elimination method $a = 100, d = -9$	1 1 1 1,1	
(b)	$100 + (n - 1)(-9) = -8$ $n = 13$	1 1	

8 (a)

$\log_{10} x$	-0.47	-0.37	-0.26	-0.07	0.03	0.15
$\log_{10} y$	1.68	1.40	1.10	0.62	0.40	0.14



Skala uniform pada kedua-dua paksi dengan 1 titik diplot dengan betul.

Plot semua 6 titik dengan betul.

Graf garis lurus penyuaian terbaik

1

1

1

1

1

1

1

1

1

1

(b)

$$\log_{10} y = \left(-\frac{1}{q}\right) \log_{10} x + \log_{10} p$$

$$\log_{10} p = 0.48$$

$$p = 3.02$$

$$-\frac{1}{q} = \frac{1.4 - 0.4}{-0.37 - 0.03}$$

$$q = 0.40$$

1

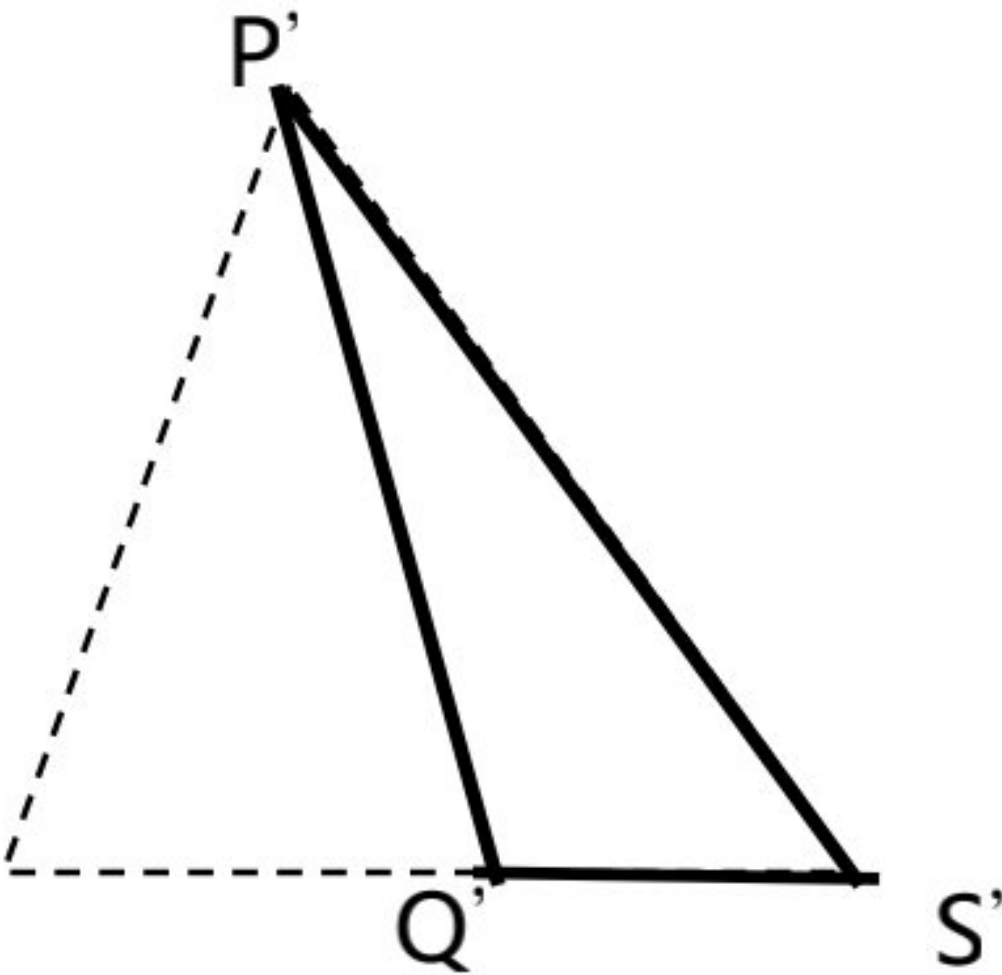
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1

1

1

9 (a) i	Tulis hukum bagi segi tiga $AY = \overrightarrow{AO} + \overrightarrow{OY}$ atau setara $\overrightarrow{AY} = -\underline{a} + \underline{b}$	1 1	10
(a) ii	$\overrightarrow{OM} = \overrightarrow{OA} + \overrightarrow{AM}$ $\frac{3}{5}\underline{a} + \frac{2}{5}\underline{b}$	1	
(b) i	$\frac{3}{5}k\underline{a} + \frac{2}{5}k\underline{b}$	1	
(b) ii	$h\underline{b}$ $\overrightarrow{OX} = \overrightarrow{OA} + \overrightarrow{AX}$ atau setara $\frac{3}{5}k\underline{a} + \frac{2}{5}k\underline{b} = \underline{a} + h\underline{b}$ Banding pekali $\frac{3}{5}k = 1$ atau $\frac{2}{5}k = h$ selesaikan $k = \frac{5}{3}$ $h = \frac{2}{3}$	1 1 1 1 1	
(c)	$OM:MX=3:2$	1	
10 (a)	$m = \frac{dy}{dx} = 2x$ $m = 2(1) = 2$ $y - 4 = 2(x - 1)$ $y = 2x + 2$	1 1 1	10
(b)	Luas lengkung, $A_1 = \int_0^1 (x^2 + 3) dx = \left[\frac{x^3}{3} + 3x \right]_0^1$ Luas trapezium, $A_2 = \frac{1}{2}(2 + 4)(1)$ Luas = $A_1 - A_2$ atau setara $= \left[\frac{x^3}{3} + 3x \right]_0^1 - 3$ $= \frac{1}{3}$	1 1 1 1	
(c)	$= \frac{1}{2}\pi \left[\frac{y^2}{2} - 3y \right]_3^5$ $= \frac{1}{2}\pi \left[\frac{5^2}{2} - 3(5) \right] - \frac{1}{2}\pi \left[\frac{3^2}{2} - 3(3) \right]$ $= \pi$	1 1 1	

11 (a)	$30C_0(0.01^0)(0.99^{30})$ atau $30C_1(0.01^1)(0.99^{29}) \times 30C_0(0.01^0)(0.99^{30})$ $1 - [30C_0(0.01^0)(0.99^{30}) + 30C_1(0.01^1)(0.99^{29}) \times 30C_0(0.01^0)(0.99^{30})]$ 9.45% 905 atau 906	1 1 1 1	
(b) i	$P\left(z \leq \frac{X - 50}{5}\right) = 0.1$ $\frac{X - 50}{5} = -1.282$ 43.59	1 1 1	10
(b) ii	$P\left(z \geq \frac{53.73 - 50}{5}\right)$ 0.2278×200 46	1 1 1	
12 (a) i	$PS = \sqrt{90^2 + 80^2}$ $= 120.42$	1	10
(a) ii	$PQ = \sqrt{90^2 + 60^2}$ $= 108.17$	1	
(b)	$(108.17)^2 = (100)^2 + (120.42)^2 - 2(100)(120.42)\cos\angle PSQ$ $\angle PSQ = 57.89^\circ$	1 1	
(c)	$Area = \sqrt{164.295(164.295 - 100)(164.295 - 108.17)(164.295 - 120.42)}$ $= 5100.20$	1 1	
(d)		1	

	$\frac{\sin Q}{120.42} = \frac{\sin 57.89}{108.17}$ $Q = 70.55^\circ$ $Q' = 180 - 70.55^\circ = 109.45^\circ$	1 1 1	
13 (a) i	(i) $\frac{7.60}{x} \times 100 = 140$ $x = \text{RM}5.43$	1	
(a) ii	$\bar{I} = \frac{140(5) + 110(3) + 105(4)}{5 + 3 + 4}$ $= 120.83$	1 1 1	
(b) i	$\bar{I} \frac{2017}{2013} = \frac{120.83 \times 120}{100}$ $= 145$	1 1	
(b) ii	$\frac{x}{600} \times 100 = 145$ $x = \text{RM}870.00$	1 1	
(c)	$x = \frac{110}{120} \times 100$ $= 91.67$ Penurunan harga sebanyak 8.33% <i>The decrease of the price 8.33%</i>	1 1 1	
14(a)	Kamirkan $\int 8 - 4t \, dt$ dan gantikan $v = -6$ dan $t = 0$ <hr/> $v = 8t - 2t^2 - 6$ Guna $a = 0$ untuk cari nilai t . $8 - 4t = 0$ <i>Gantikan $t = 2$ dalam v dan $v \text{ mak.} = 2$</i>	1 1 1	
(b)	Kamirkan $\int 8t - 2t^2 - 6 \, dt$ dan gantikan $s = 0$ dan $t = 0$ <hr/> $s = 4t^2 - \frac{2}{3}t^3 - 6t$ Faktorkan $s = -\frac{2}{3}t(t - 3)^2$ dan gunakan $s = 0$. $t = 3$	1 1 1	10
(c)		1	

<p>(d)</p>	$\left \left[4t^2 - \frac{2}{3}t^3 - 6t \right]_0^1 \right + \left[4t^2 - \frac{2}{3}t^3 - 6t \right]_1^3$ <p>Gantikan $t = 1$ dan $t = 0$ ke $\left \left[4t^2 - \frac{2}{3}t^3 - 6t \right]_0^1 \right$ dan $t = 3$ dan $t = 1$ ke $\left[4t^2 - \frac{2}{3}t^3 - 6t \right]_1^3$</p> $\left -2\frac{2}{3} \right + \left[0 - \left(-2\frac{2}{3} \right) \right]$ $5\frac{1}{3}$	<p>1</p> <p>1</p> <p>1</p>	
<p>Selamat mengulangkaji dari telegram@soalanpercubaanspm Skema MT K2 Melaka 2023</p>			

