



**MAJLIS PENGETUA SEKOLAH MALAYSIA (MPSM)
NEGERI PERAK**

**MODUL KECEMERLANGAN PEPERIKSAAN PERCUBAAN TAHUN 2024
TINGKATAN 5**

**MATEMATIK TAMBAHAN
KERTAS 2
SKEMA JAWAPAN**

| NO | BUTIRAN | MARKAH | JUMLAH |
|---------------------------|---------|--|-------------|
| 1 | (a) | $\frac{2 \sin x \cos x}{\cos^2 x - \sin^2 x}$ | 1 |
| | | $\frac{\sin 2x}{\cos 2x} = \tan 2x$ | 1 |
| | (b) (i) | <p style="text-align: center;">Bentuk graf sinus Nilai min=1 dan nilai maks.=3 2 kitaran untuk 2π</p> | 1 1 1 |
| | (ii) | $y = \frac{\pi}{x}$ <p style="text-align: center;">Lakar graf salingan $y = \frac{\pi}{x}$ Bilangan penyelesaian: 3</p> | 1 1 1 |
| JUMLAH KESELURUHAN | | | 8 |

| NO | | BUTIRAN | MARKAH | JUMLAH |
|----|---------------------------|---|-------------|--------|
| 2 | (a) | $x(-20x+100)-100(1)$ $P = -20x^2 + 100x - 100$ | 1 1 | 2 |
| | (b) | $P = -20 \left[x^2 - 5x + \left(\frac{-5}{2}\right)^2 - \left(\frac{-5}{2}\right)^2 \right] - 100$ atau $P = -20 \left[x^2 - 5x + \left(\frac{-5}{2}\right)^2 - \left(\frac{-5}{2}\right)^2 + 5 \right]$ $P = -20 \left(x - \frac{5}{2} \right)^2 + 25$ | 1 1 1 | |
| | (i) | Jumlah keuntungan maksimum = RM 25 | 1 | |
| | (ii) | Harga seunit ais krim untuk mencapai keuntungan maksimum = RM 2.50 | 1 | |
| | (ii) | 50 | 1 | |
| | JUMLAH KESELURUHAN | | | |

| NO. | BUTIRAN | | MARKAH | JUMLAH |
|---------------------------|---------|--|------------------|----------|
| 3 | (a) | Koordinat $S = \left(\frac{8}{5}, 0\right)$ $\frac{n(1) + m(2)}{m + n} = \frac{8}{5}$ atau $\frac{n(3) + m(-2)}{m + n} = 0$ $m : n = 3 : 2$ | 1 1 1 | 3 |
| | (b) | $\frac{1}{2} \begin{vmatrix} 1 & x & 2 & 1 \\ 3 & y & -2 & 3 \end{vmatrix} = 13$ (Panduan sahaja) <hr/> $\frac{1}{2} [1(y) + x(-2) + 2(3)] - [3(x) + y(2) + (-2)(1)] = 13$ $-5x - y = 18$ atau setara Selesaikan persamaan serentak $-5x - y = 18$ dan $2y - 3x = 3$ dengan kaedah penghapusan atau penggantian $2(-5x - 18) - 3x = 3$ atau setara $x = -3, y = -3$ $Q = (-3, -3)$ | 1 1 1 1 | 4 |
| JUMLAH KESELURUHAN | | | | 7 |

| NO. | BUTIRAN | | MARKAH | JUMLAH |
|---------------------------|---------|---|------------------|----------|
| 4 | (a) | $21 = a + (2-1)d$ atau $81 = a + (12-1)d$ $a = 15$ dan $d = 6$ $\frac{12}{2} [2(15) + (12-1)(6)]$ 576 | 1 1 1 1 | 4 |
| | (b) | $n = 15$ [Dilihat] $\frac{15}{2} [2(15) + (15-1)(6)]$ 855 Memadai menambah lagi 3 baris kerana $855 > 850$. | 1 1 1 1 | 4 |
| JUMLAH KESELURUHAN | | | | 8 |

| NO. | BUTIRAN | MARKAH | JUMLAH |
|--|---|--------|----------|
| 5 | Guna mana- mana hukum indeks atau hukum log | | |
| | $5^2(5^{x+4}) = (5^3)^y // 5^{2+x+4} = 5^{3y}$ atau $\log_x \frac{y}{x-2} = 1 //$ | 1 | 6 |
| | $\log_x \left(\frac{y}{x} \right) = \log_x (x-2)$ | | |
| | $x+6=3y$ atau $y = x^2 - 2x // x+6 = 3(x^2 - 2x)$ | 1 | |
| $y = (3y-6)^2 - 2(3y-6)$ Selesaikan persamaan kuadratik | 1 | | |
| | $(y-3)(9y-16) = 0$ atau $(3x+2)(x-3)$ | 1 | |
| | $\therefore x = 3, y = 3$ | 1, 1 | |
| JUMLAH KESELURUHAN | | | 6 |

| NO. | BUTIRAN | MARKAH | JUMLAH |
|-----|--|-------------|--------|
| 6 | (a) $h: x \rightarrow \frac{1}{2}x + 3 // h(x) = \frac{1}{2}x + 3$ | 1 | 1 |
| | (b) $x = 2y - 6$ $h^{-1}(x) = 2(x-3) // h^{-1}(x) = 2x - 6$ | 1 1 | 2 |
| | (c) $g(x) = gh[2(x-3)]$ $g(x) = [2(x-3)^2] + 2[2(x-3)] + 3$ $g(x) = 4x^2 - 20x + 27$ | 1 1 1 | 3 |
| | JUMLAH KESELURUHAN | | |

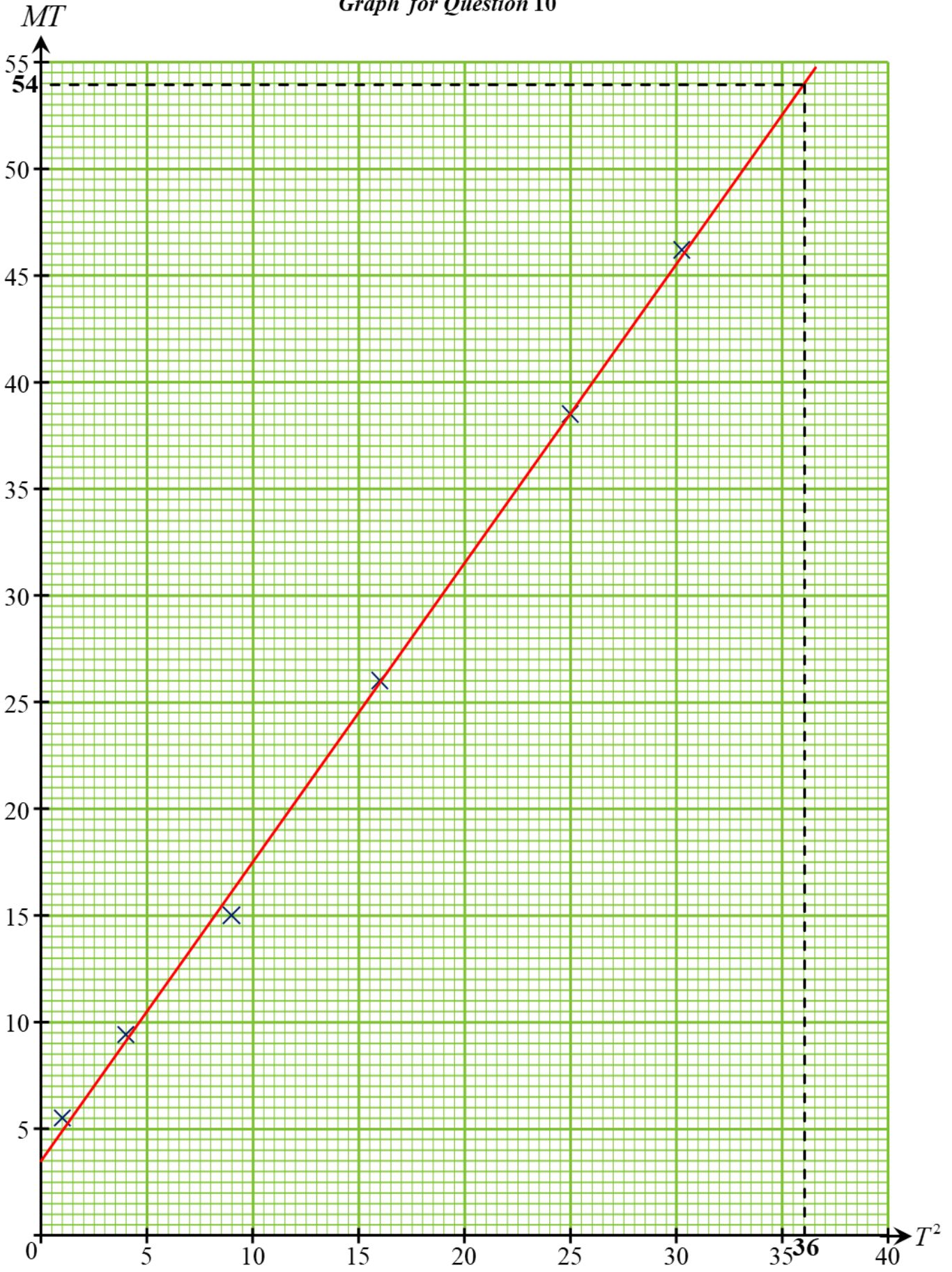
| NO. | BUTIRAN | MARKAH | JUMLAH |
|---------------------------|---|--------------------|----------|
| 7 | (a) $\overline{AR} = \overline{AB} + \overline{BR}$ atau $\overline{PR} = \overline{PA} + \overline{AR} //$ setara | 1 | 3 |
| | $\overline{AR} = \frac{2}{3}x - y$ | 1 | |
| | $\overline{PR} = \frac{2}{3}x$ | 1 | |
| | (b) $\overline{AR} = h(\overline{AD} + \overline{DC})$ $\frac{2}{3}x - y = h(-3y + kx - y)$ $\frac{2}{3} = hk$ atau $-1 = -4h$ $h = \frac{1}{4}$ dan $k = \frac{8}{3}$ | 1 1 1 1,1 | 5 |
| JUMLAH KESELURUHAN | | | 8 |

| NO. | BUTIRAN | | MARKAH | JUMLAH | |
|-----|---------|---------------------------|--|------------------|---|
| 8 | (a) | (i) | ${}^{10}C_7 \times (0.8)^7 \times (0.2)^{10-7}$ 0.2013 | 1 1 | 2 |
| | | (ii) | ${}^{10}C_8 \times (0.8)^8 \times (0.2)^{10-8} + {}^{10}C_9 \times (0.8)^9 \times (0.2)^{10-9} + {}^{10}C_{10} \times (0.8)^{10} \times (0.2)^{10-10}$ 0.6778 | 1 1 | |
| | (b) | $154(0.8)(0.2)$ 24.64 | 1 1 | 2 | |
| | (c) | | $P\left(\frac{50-45}{10} < Z < \frac{70-45}{10}\right)$ 0.3085 - 0.00621 0.30229 30.23% | 1 1 1 1 | 4 |
| | | JUMLAH KESELURUHAN | | | |

| NO. | BUTIRAN | | MARKAH | JUMLAH | | | | | | | | | |
|-----|---|--------------------------------------|--|--------------------------------------|---|---|---|---|-----------------------|---|---|---|---|
| 9. | (a) | | $\frac{dy}{dx} = 4 - \frac{4}{3}x$ $4 - \frac{4}{3}x = 0$ dan $x = 3$ | 1 1 | 4 | | | | | | | | |
| | | | <table border="1"> <tr> <td>Tanda bagi $\frac{dy}{dx}$</td> <td>+</td> <td>0</td> <td>-</td> </tr> <tr> <td>Lakaran tangen</td> <td>/</td> <td>—</td> <td>\</td> </tr> </table> | Tanda bagi $\frac{dy}{dx}$ | | + | 0 | - | Lakaran tangen | / | — | \ | 1 |
| | | Tanda bagi $\frac{dy}{dx}$ | + | 0 | | - | | | | | | | |
| | | Lakaran tangen | / | — | | \ | | | | | | | |
| | Titik maksimum = $\left(3, 6\frac{2}{3}\right)$ | 1 | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| (b) | (i) | | $-\frac{4}{x} + c$ $\left[-\frac{4}{(4)} - \left(-\frac{4}{(2)}\right)\right]$ 1 | 1 1 1 | 3 | | | | | | | | |
| | | (ii) | $\pi \left[-\frac{16}{3x^3}\right]_2^4$ $\pi \left[-\frac{16}{3(4)^3} - \left(-\frac{16}{3(2)^3}\right)\right]_2^4$ $\frac{7}{12}\pi$ | 1 1 1 | | 3 | | | | | | | |
| | JUMLAH KESELURUHAN | | | 10 | | | | | | | | | |

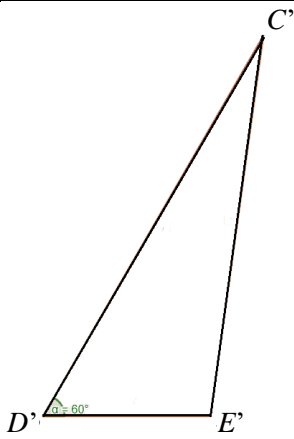
| NO. | BUTIRAN | | | | | | MARKAH | JUMLAH | | | | | | | | | | | | | | | |
|---------------------------|---|--|-----|----|----|------|--------|-----------|---|---|---|----|----|-------|------|-----|-----|----|----|------|------|---|---|
| 10 | (a) | <table border="1"> <tr> <td>T^2</td> <td>1</td> <td>4</td> <td>9</td> <td>16</td> <td>25</td> <td>30.25</td> </tr> <tr> <td>MT</td> <td>5.5</td> <td>9.4</td> <td>15</td> <td>26</td> <td>38.5</td> <td>46.2</td> </tr> </table> | | | | | | T^2 | 1 | 4 | 9 | 16 | 25 | 30.25 | MT | 5.5 | 9.4 | 15 | 26 | 38.5 | 46.2 | 1 | 5 |
| | | T^2 | 1 | 4 | 9 | 16 | 25 | 30.25 | | | | | | | | | | | | | | | |
| | MT | 5.5 | 9.4 | 15 | 26 | 38.5 | 46.2 | | | | | | | | | | | | | | | | |
| | Graf – lihat lampiran Paksi yang betul dan seragam dari titik pertama sehingga terakhir dan sekurang-kurangnya satu titik diplot dengan betul (berdasarkan jadual calon) *6 titik diplot dengan betul Garisan penyuaiian terbaik | | | | | | 1 | | | | | | | | | | | | | | | | |
| | | | | | | | 1 | | | | | | | | | | | | | | | | |
| | | | | | | 1 | | | | | | | | | | | | | | | | | |
| | | | | | | 1 | | | | | | | | | | | | | | | | | |
| (b) | (i) | $MT = qT^2 + \frac{r}{q}$ $q = \frac{*26 - *9.4}{*16 - *4} \text{ dan}$ $q = 1.383$ | | | | | | 1 | 4 | | | | | | | | | | | | | | |
| | | | | | | | 1 | | | | | | | | | | | | | | | | |
| | (ii) | $\frac{r}{*1.383} = *3.5$ $r = 4.841$ | | | | | | 1 | | | | | | | | | | | | | | | |
| (c) | 9 kg | | | | | | 1 | 1 | | | | | | | | | | | | | | | |
| JUMLAH KESELURUHAN | | | | | | | | 10 | | | | | | | | | | | | | | | |

Graf untuk Soalan 10
Graph for Question 10



| NO. | BUTIRAN | MARKAH | JUMLAH | |
|---------------------------|---|--|--------|-----------|
| 11 | (a) | $\cos\left(\frac{\angle POQ}{2}\right) = \frac{10}{40}$ atau $\cos\alpha = \frac{10}{40}$ atau yang setara $\angle POQ = 2.636 \text{ rad.}$ | 1 | 2 |
| | | | 1 | |
| | (b) | $(40)(2.636)$ $2\sqrt{40^2 - 10^2} // PQ = \sqrt{40^2 + 40^2 - 2(40)(40)\cos 151.04^\circ}$ $2\sqrt{40^2 - 10^2} + (40)(2.636)$ 182.90 cm | 1 | 4 |
| | | | 1 | |
| | | | 1 | |
| | | | 1 | |
| (c) | $\frac{1}{2}(40)^2(2.636)$ $\frac{1}{2}(40)^2(\sin 151.04^\circ)$ atau $\frac{1}{2}(40)^2(2.636)$ $\frac{1}{2}(40)^2(2.636) - \frac{1}{2}(40)^2(\sin 151.04^\circ)$ 1721.34 // 1721.44 | 1 | 4 | |
| | | 1 | | |
| | | 1 | | |
| | | 1 | | |
| JUMLAH KESELURUHAN | | | | 10 |

| NO. | BUTIRAN | MARKAH | JUMLAH |
|--|---|--------|-----------|
| 12 | (a) $v = 3ht^2 + 2kt + 6$ atau $a = 6ht + 2k$ | 1 | 5 |
| | Gantikan $t = 3$ dan $a = 0$ dalam $a = 6ht + 2k$ atau Gantikan $t = 3$ dan $v = 15$ dalam $v = 3ht^2 + 2kt + 6$ | 1 | |
| | $6h(3) + 2k = 0$ atau $3h(3)^2 + 2k(3) + 6 = 15$ | 1 | |
| | Selesaikan persamaan serentak secara penghapusan atau penggantian $27h + 6(-9h) = 9$ | 1 | |
| | $h = -\frac{1}{3}, k = 3$ | 1,1 | |
| | (b) $-2t + 6 < 0$ | 1 | 2 |
| | $t > 3$ s | 1 | |
| | (c) Gantikan $t = 1$ @ $t = 2$ dalam s | | 3 |
| | $-\frac{1}{3}(1)^3 + 3(1)^2 + 6(1)$ @ $-\frac{1}{3}(2)^3 + 3(2)^2 + 6(2)$ | 1 | |
| | $\left[-\frac{1}{3}(2)^3 + 3(2)^2 + 6(2)\right] - \left[-\frac{1}{3}(1)^3 + 3(1)^2 + 6(1)\right]$ | 1 | |
| $\frac{38}{3} // 12\frac{2}{3} // 12.67$ | 1 | | |
| JUMLAH KESELURUHAN | | | 10 |

| NO. | BUTIRAN | | MARKAH | JUMLAH | |
|---------------------------|---------|---|---|-------------|---|
| 13 | (a) | (i) | $FG^2 = 18^2 + 17^2 - 2(18)(17)\cos 50^\circ$ $FG = 14.82$ | 1 1 | 5 |
| | | (ii) | $\frac{(24+18)}{\sin 70^\circ} = \frac{CE}{\sin 60^\circ}$ $EG = 38.71 - 17$ $EG = 21.71$ | 1 1 1 | |
| | (b) | $\Delta FCG = \frac{1}{2}(18)(17)\sin 50^\circ$ $\frac{DH}{\sin 90^\circ} = \frac{DI}{\sin 30^\circ}$ $58.60 = \frac{1}{2}(2DI)(DI)\sin 60^\circ$ $DI = 8.22 \text{ cm}$ | 1 1 1 1 | 4 | |
| | (c) |  <p>Lakaran menggunakan pembaris dan $\angle C'E'D'$ mesti sudut cakah</p> | 1 | 1 | |
| JUMLAH KESELURUHAN | | | | 10 | |

| NO. | BUTIRAN | | MARKAH | JUMLAH |
|-----|---------|--|--------|--------|
| 14 | (a) | $x = \frac{2.50}{2.00} \times 100$ | 1 | 3 |
| | | $x = 125$ | 1 | |
| | | Peningkatan harga bahan P sebanyak 25% pada tahun 2022 berbanding tahun 2020 | 1 | |
| | (b) | $\frac{125(1) + 120(1) + 150(1) + 80(1)}{1 + 1 + 1 + 1}$ = 118.75 | 1 | 2 |
| (c) | (i) | $\frac{125(25) + 120(15) + 150(20) + 80(40)}{25 + 15 + 20 + 40}$ = 111.25 | 1 | 5 |
| | | $\frac{111.25 \times 130}{100}$ = 144.63 | 1 | |
| | (ii) | Kos pembuatan makanan tersebut meningkat sebanyak 44.63% pada tahun 2024 berbanding tahun 2020 | 1 | |
| | | JUMLAH KESELURUHAN | | |

| NO. | BUTIRAN | | MARKAH | JUMLAH | |
|---------------------------|---------|--|--|--------|---|
| 15 | (a) | $\frac{1}{4}x + \frac{2}{5}y \leq 20$ atau $5x + 8y \leq 400$ | 1 | 2 | |
| | | $\frac{3}{4}x + \frac{3}{5}y \leq 36$ atau $5x + 4y \leq 240$ | 1 | | |
| | (b) | Untuk graf – Lihat Lampiran | 3 | 3 | |
| | (c) | (i) | Lukis $4x + 5y = k$ | 1 | 5 |
| | | | (16,40) | 1 | |
| | | | Jisim tepung ros, $x = 16$ kg dan Jisim tepung lavender, $y = 40$ kg | 1 | |
| (ii) | | $4(16) + 5(40)$ RM 264.00 | 1 | | |
| JUMLAH KESELURUHAN | | 10 | | | |

Graf untuk Soalan 15
Graph for Question 15

