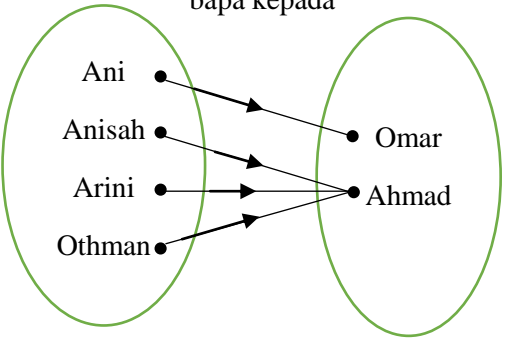
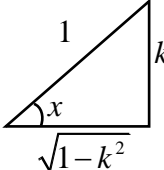


MARK SCHEME FOR ADDITIONAL MATHS. – MPP3**PAPER 1**

| No | Mark Scheme | Σ Marks |
|----|---|----------------|
| 1 | <p>(a) AB 1</p> <p>(b) CD 1</p> <p>(c) AB 1</p> | 3 |
| 2 | <p>(a) (i) $y = \frac{270-3x}{2}$ 1</p> <p>(ii) $A = \frac{810x-9x^2}{2}$ 1</p> <p>(b) $x = 45$ m 2 $405-9x = 0$ B1</p> | 4 |
| 3 | <p>21 3</p> <p>$(1)(8-1) + [18 - (5-1)(1)]$ B2</p> <p>$18 - (5-1)(1)$ or $(1)(8-1)$ B1</p> | 3 |
| 4 | <p>$p = -3m - 4$ 3</p> <p>$\vec{AB} = \frac{1}{3}\vec{BC}$ or $\vec{AB} = \frac{1}{4}\vec{AC}$ or equivalent B2</p> <p>$\vec{AB} = -(m+1)\vec{i} + 3\vec{j}$ OR $\vec{BC} = (p+1)\vec{i} + 9\vec{j}$</p> <p>OR $\vec{AC} = (p-m)\vec{i} + 12\vec{j}$ B1</p> | 3 |

| | | | |
|----------|--|--|----------|
| 5 | <p>(a) $\sqrt{85}$ or 9.2195 $\sqrt{2^2 + 9^2}$</p> <p>(b) $\vec{OT} = 3\vec{a} + \vec{b}$ $\vec{OT} = \vec{OQ} + \vec{QT}$</p> | <p>2 B1 2 B1</p> | 4 |
| 6 | <p>$x = \frac{2}{3}$ $3x = 2$ $6^{3x} = 6^2$</p> | <p>3 B2 B1</p> | 3 |
| 7 | <p>3</p> <p>$\frac{\log_m \left(\frac{2}{9}\right)^3}{\log_m \left(\frac{2}{9}\right)}$ or $\frac{\log_m \frac{2^3}{3^6}}{\log_m \frac{2}{9}}$</p> <p>$\log_m \frac{2^3}{3^6}$ or $\log_m \frac{2}{9}$</p> | <p>3 B2 B1</p> | 3 |
| 8 | <p>$p = \frac{m^2 q}{125n^3}$ $\frac{m^2 q}{pn^3} = 5^3$ $\log_5 \frac{m^2 q}{n^3 p} = 3$</p> | <p>3 B2 B1</p> | 3 |
| 9 | <p>$n = 23$ (terima $n = 22$) $140 + (n-1)(-5) = 96 + (n-1)(-3)$ $140 + (n-1)(-5)$ or $96 + (n-1)(-3)$</p> | <p>3 B2 B1</p> | 3 |

| | | |
|----|--|--|
| 10 | <p>(a) $x = 5$ and $y = 6$</p> $\frac{x+1}{4} = \frac{1}{2x-7}$ <p>(b) $S_{\infty} = 12$</p> $S_{\infty} = \frac{6}{1 - \frac{1}{2}}$ | <p>2</p> <p>B1</p> <p>2</p> <p>B1</p> <p>4</p> |
| 11 | <p>$p = \frac{1}{4}$, $q = -2$ (both)</p> $\frac{q-4}{0-2} = 3 \text{ or } -2 = \log_2 p$ $\log_2 y = \log_2 p + 3 \log_2 x$ | <p>3</p> <p>B2</p> <p>B1</p> <p>3</p> |
| 12 | <p>(a)</p>  <p>(b) banyak kepada satu</p> | <p>1</p> <p>1</p> <p>2</p> |
| 13 | $m = \frac{k-2}{8}$ $\frac{(k-1)-1}{m} = 8 \text{ or } 8m+1 = k-1$ $f^{-1}(x) = \frac{x-1}{m} \text{ or } f(8) = k-1$ | <p>3</p> <p>B2</p> <p>B1</p> <p>3</p> |
| 14 | $k = \frac{h+1}{4}$ $(h+1)^2 - 4(k)(4k) = 0$ | <p>2</p> <p>B1</p> <p>2</p> |

| | | |
|-----------|--|--|
| 15 | <p>(a) $a < 0$</p> <p>(b) $q = 2$ and $p = -3$ $q = 2$ or $p = -3$ or $(3, 2)$</p> | <p>1</p> <p>2</p> <p>B1</p> <p>3</p> |
| 16 | <p>$x = 105^\circ, 165^\circ, 285^\circ, 345^\circ$</p> <p>$2x = 210^\circ, 330^\circ, 570^\circ, 690^\circ$</p> <p>$2 \sin 2x + 1 = 0$ or equivalent</p> | <p>3</p> <p>B2</p> <p>B1</p> <p>3</p> |
| 17 | <p>(a) $-\sqrt{1-k^2}$</p> <p>$-\cos x$ or </p> <p>(b)</p> $\frac{1}{2k(\sqrt{1-k^2})}$ <p>$\frac{1}{2 \sin x \cos x}$ or $\frac{1}{\sin 2x}$</p> | <p>2</p> <p>B1</p> <p>2</p> <p>B1</p> <p>4</p> |
| 18 | <p>$12.29 + 3\pi$</p> <p>$9 \times \frac{\pi}{3} + \sqrt{9^2 - 4.5^2} + 4.5$ or $9 \times \frac{\pi}{3} + 9 \sin 60^\circ + 4.5$</p> <p>$s = 9 \times \frac{\pi}{3}$ or $9 \times \sin 60^\circ$ or $\sqrt{9^2 - 4.5^2}$</p> <p>$\theta = \frac{\pi}{3}$ or 60°</p> | <p>4</p> <p>B3</p> <p>B2</p> <p>B1</p> <p>4</p> |
| 19 | <p>$p = -6t$</p> <p>$h = -\frac{2}{3}t$</p> <p>$p = \frac{3(3h)+1(3p)}{4}$ or $t = \frac{3(-h)+1(2t)}{4}$</p> | <p>3</p> <p>B2</p> <p>B1</p> <p>3</p> |
| 20 | <p>(a) $x = 3$</p> $\frac{9+5+6+x^2-2+8}{5} = 7$ <p>(b) 2</p> $\frac{9^2+5^2+6^2+7^2+8^2}{5} - 7^2$ | <p>2</p> <p>B1</p> <p>2</p> <p>B1</p> <p>4</p> |

| | | | |
|-----------|--|--|----------|
| 21 | 10 15 – 5 $Q_1 = 5$ atau $Q_3 = 15$ | 3 B2 B1 | 3 |
| 22 | (a) $\frac{5}{36}$ (b) $\frac{11}{36}$ $\{(1,6), (2,6), (3,6), (4,6), (5,6), (6,6), (6,5), (6,4), (6,3), (6,2), (6,1)\}$ | 1 2 B1 | 3 |
| 23 | (a) 41 $5C_1 \times 5C_1$ atau $4C_1 \times 4C_1$ (b) 4 $2P_1 \times 2P_2 \times 1P_1$ | 2 B1 2 B1 | 4 |
| 24 | (a) 0.1478 ${}^{10}C_2 \times 0.08^2 \times 0.92^8$ (b) 0.4344 ${}^{10}C_0 \times 0.08^0 \times 0.92^{10}$ | 2 B1 1 | 3 |
| 25 | 0.25804 $0.5 - 0.1612 - 0.08076$ 0.08076 | 3 B2 B1 | 3 |