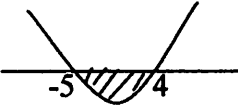


SPM TRIAL EXAM 2012
Marking Scheme
Additional mathematics Paper I

Number	Solution and marking scheme	Sub Marks	Full Marks
1	(a) {p, r, s} (b) {a, b, c, d} (c) Many to One	1 1 1	3
2	(a) $\frac{7}{2}$ B1: $2x - 5 = 2$ atau $f(x) = \frac{x+5}{2}$	2	2
3	(a) 5 (b) $2x+4$ B2: $-3f(x)+5 = -6x-7$ B1: $-3f(x)+5$	1 3	4
4	$p = -7, q = -10$ (both) B2: $p = -7$ or $q = -10$ B1: $\frac{7}{3} = \frac{-p}{3}$ or $\frac{-10}{3} = \frac{q}{3}$ or $3x^2 - 7x - 10 = 0$ or $3(-1)^2 + p(1) + q = 0, 3(10/3)^2 + p(10/3) + q = 0$	3	3
5	$h=2$ and $k=3$ B2: $h=2$ atau $k=3$ B1: $\frac{h}{3} = 1$ or $h^2 + 2 + k = 9$	3	3
6	$-5 \leq x \leq 4$ B2: $(x-4)(x+5) \leq 0$ or  B1: $x^2 + x - 20 \leq 0$	3	3

7	$\frac{2}{r} + \frac{1}{p}$ or $\frac{2p+r}{pr}$ B3: $\frac{\log_2 2}{\log_2 m} + 2 \frac{\log_3 3}{\log_3 m}$ B2: $\log_m 2 + 2 \log_m 3$ or $\frac{\log_2 2}{\log_2 m} + \frac{\log_3 3^2}{\log_3 m}$ B1: $\log 2 + \log 3^2$ or $2 \log_m 3$ or $\frac{\log 2}{\log m}$ or $\frac{\log 3}{\log m}$	4	4
8	$x = 8p + 15$ B2: $x - 3 = 4(2p + 3)$ B1: 2^3 or $2^{4(2p+3)}$	3	3
9	a) 3 b) 360 B1: $\frac{18}{2} [2(3) + (18-1)2]$	1 2	3
10	$a = -13, d = 4$ (both) B2: $a = -13$ or $d = 4$ B1: $a + 2d = -5$ or $a + 7d = 15$	3	3
11	(a) $r = x^2$ (b) $\frac{1}{3}$ B1: $\frac{1}{8} = \frac{x^2}{1-x^2}$	1 2	3
12	a) $\frac{y}{x} = px^2 + q$ b) $p = -2, q = 8$ B2: $p = -2$ or $q = 8$ B1: $p = \frac{4-0}{2-4}$ or $0 = (-2)(4) + q$ or $4 = p(2) + q$	1 3	4

13	2,12 B2: $\left(\frac{3-7}{h-4}\right) \times \left(\frac{3-(-1)}{h-10}\right) = -1$ or form equation using Pythagoras theorem B1: $\frac{3-7}{h-4}$ or $\frac{3-(-1)}{h-10}$ of find the lengths of AB, BC and AC using distance formula	3	3
14	(a) $\frac{1}{w}$ (b) $2w\sqrt{1-w^2}$ B1: $\sqrt{1-w^2}$ or $2w\cos\theta$	1 2	3
15	$26.57^\circ, 116.57^\circ, 206.57^\circ, 296.57^\circ$ B3: 26.57° and 116.57° B2: $(2 \tan x - 1)(\tan x + 2)$ B1: $2 \tan^2 x + 3 \tan x - 2 = 0$	4	4
16	(a) 13 (b) $k = -13$ B1: $\begin{pmatrix} 12+k+1 \\ -5+2 \end{pmatrix}$ or $(12+k+1)\underline{i} + (-5+2)\underline{j}$	1 2	3
17	(a) $4\underline{a} + 4\underline{b}$ (b) $-2\underline{a} + 4\underline{b}$ B1: $-6\underline{a} + (4\underline{a} + 4\underline{b})$	1 2	3
18	8 B2: $1.3r + r + r + 1.3(r-3) + (r-3) + (r-3) = 42.9$ B1: $1.3r$ or $1.3(r-3)$	3	3
19	$\frac{12}{5}$ B2: $2\left(\frac{3(2)}{2^2+1} - 0\right)$ B1: $2\left[\frac{3x}{x^2+1}\right]_0^2$	3	3

20	$a^2 + a - 12$ B2: $[(a^2 + a) - ((-4)^2 + (-4))]$ B1: $[x^2 + x]$	3	3
21	$k = 8$ B3: $(k+1)(k-8) = 0$ B2: $\frac{2^2 + 5^2 + k^2}{3} - \left(\frac{2+5+k}{3}\right)^2 = 6$ B1: $\bar{x} = \frac{2+5+k}{3}$ or $\sum x^2 = 2^2 + 5^2 + k^2$	4	4
22	$\left(\frac{1}{3}, -\frac{2}{3}\right)$ B2: $x = \frac{1}{3}$, $y = 2(\frac{1}{3})(3 \times \frac{1}{3} - 2)$ B1: $12x - 4 = 0$	3	3
23	(a) 1 (b) i) 5040 ii) 288 B1: $2 \times 3! \times 4!$	1 1 2	4
24	(a) $\frac{4}{15}$ (b) $\frac{3}{5}$ B1: $1 - \left(\frac{3}{5}\right)\left(\frac{2}{3}\right)$ or $\frac{2}{5} \times \frac{1}{3} + \frac{3}{5} \times \frac{1}{3} + \frac{2}{5} \times \frac{2}{3}$	1 2	3
25	(a) $\frac{3}{5}$ (b) $\frac{144}{625}$ B1: ${}^5C_2 \left(\frac{3}{5}\right)^2 \left(\frac{2}{5}\right)^3$	1 2	3