ADD MATHS MARKING SCHEME YIK TRIAL 2020 – P1

No.	Solution and Marking Scheme	Sub-marks	Total Marks
1.	Not a function. $g(x)$ is a quadratic function. It is not a one-to-one relation and hence, the inverse does not exist.	1 1	2
2.	$k = 49$ B2: $2\left(\frac{7}{2}\right)^2 - \frac{k}{2}$ B1: $a + 2a = 21$ or $2a^2 = \frac{k}{2}$ *(let a = the smaller roots)	3	3
3.	(a) $x = -3$ (b) $p = 3$, $q = 3$	1 2	3
4.	$-12 < m < 4$ B2: $(m + 12)(m - 4) < 0$ B1: $m^2 - 4(2)(6 - m) < 0$	3	3
5.	9 B1: $3^{2x-2-x} = 5^x$	2	2
6.	$x = -21$ B2: $(x^2 + 56x + 784) - (x^2 + 52x + 676) = (x^2 + 52x + 676) - (x^2 + 40x + 400)$ B1: $(28 + x)^2 - (26 + x)^2 = (26 + x)^2 - (20 + x)^2$	3	3
7.	Year 2028 B2: $n = 10$ B1: $280000(1.09)^{n-1} > 280000 \times 2$	3	3
8.	$x = h + 3$ B2: $1 = \frac{h^2}{(x-3)^2}$ B1: $\frac{dy}{dx} = 1 - \frac{h^2}{(x-3)^2}$ *(Stationary Points = Turning Points)	3	3
9.	$k = 3$ B2: $x = 3$ B1: $\frac{dy}{dx} = -2x + 6$ or $\frac{-6}{2(-1)} = 3$ *($\frac{-b}{2a}$ = axis of symmetry)	3	3
10.	$\log_4 2 = \frac{3y}{8} - \frac{1}{4x}$ or $\log_4 2 = \frac{2}{3y} + \frac{1}{3xy}$ B2: $\log_4 2^4 + \log_4 5 = \frac{3y}{2}$ or $\log_4 (16 \times 5) = \frac{3y}{2}$ B1: $\frac{\log_4 80}{\log_4 8} = y$	3	3

11.	(a) $y^2 = \frac{3}{2}\sqrt{x} + 1$ B1: $(13)^2 = \frac{3}{2}(8) + n$ (b) $x = 100$ B1: $16 = \frac{3}{2}\sqrt{x} + 1$	2 2	4
12.	(a) ∠BOC = 1.2165 rad. B1: $8^2 = 7^2 + 7^2 – 2(7)(7) \cos$ ∠BOC (b) 35.4757 cm B2: $7 + 8 + 7 + (\pi – 1.21649)(7)$	2 2	4
13.	5.8817 km B2: $\frac{1}{2}\sqrt{185}(x) = 40$ B1: BC = $\sqrt{(8-(-3))^2 + (3-11)^2}$	3	3
14.	$k = 2$ B2: $(k – (–2))/(3 – k) = 4$ B1: $m(-\frac{1}{4}) = –1$ or $m = –1 \div (-\frac{1}{4})$	3	3
15.	(a) $t = 3$ s B1: $(3t – 15 + 2t) = 0$ *(group $\underset{\sim}{j}$) (b) $v = (–3\underset{\sim}{i} – 2\underset{\sim}{j})$ cm $s^{–1}$ B1: $(20 + 3p)\underset{\sim}{i} + 9\underset{\sim}{j} = 11\underset{\sim}{i} + 9\underset{\sim}{j}$	2 2	4
16.	$\overrightarrow{OQ} = \left(\frac{6}{5}\right)\underset{\sim}{a} + \left(\frac{12}{5}\right)\underset{\sim}{b}$ B1: $\overrightarrow{AQ} = \left(\frac{3}{5}\right)(–3\underset{\sim}{a} + 4\underset{\sim}{b})$	2	2
17.	(a)(i) $y = –\left(\frac{3}{2}\right)x + 135$ (ii) $A = –\left(\frac{9}{2}\right)x^2 + 405x$ (b) $x = 45$ m B1: $–9x + 405 = 0$	1 1 2	4
18.	$x – \frac{1}{2}$ B2: $\frac{(2x-1)\log_5 5}{2}$ B1: $\log_{25}\frac{5^{2x}}{5}$ or $\log_{25} 5^{2x-1}$	3	3
19.	$\frac{-\sqrt{3}}{2}$ B2: $–\sqrt{3} \sin\theta = 2 \cos\theta$ B1: $3 \cos\theta = 2(\cos 60 \cos\theta – \sin 60 \sin\theta)$	3	3
20.	(a) $n = 3m + 4$ (b) $m = 6$ B2: $3m^2 + 8m – 156 = 0$ B1: $66 + 12 = \left(\frac{1}{2}\right)(4 + (3m + 4))(m)$	1 3	4

21.	(a) M and N are not mutually exclusive. ($P(M) + P(N) = 0.7 \neq 0.58$) (b) M and N are independent. ($P(M) \times P(N) = P(M \cap N)$) $P(M \cap N) = P(M) + P(N) - P(M \cup N) = 0.7 - 0.58 = 0.12$	1 1 1	3
22.	6 B2: $3(2!)$ or $\left(\frac{4!}{2!}\right) - 3!$ B1: $3!$	3	3
23.	*Melor* : *Teratai* = 1 : 3 B2: $7.8m = 2.6t$ B1: $\frac{65.2m+75.6t}{m+t} = 73$ *(let m = Melor, t = Teratai)	3	3
24.	(a) $\frac{8}{17}$ B1: $\left(\frac{9}{17}\right)\left(\frac{8}{16}\right)$ or $\left(\frac{8}{17}\right)\left(\frac{7}{16}\right)$ (b) $\frac{9}{34}$	2 1	3
25.	(a) $k = \frac{1}{12}$ B1: $\|-4\|k + \|-3\|k + \|-2\|k + \|-1\|k + 2k = 1$ (b) *(Question Error)	2 (2)	4

– Edited by **Teacher Hong Yan Meei** –