

ADD MATHS MARKING SCHEME YIK TRIAL 2020 – P1

No.	Solution and Marking Scheme	Sub-marks	Total Marks
1.	$ax^2 - (2 + a^2)x + 2a = 0$ B2: $\frac{a^2+2}{a}$ and 2 (both) B1: SOR = $a + \frac{2}{a}$ or POR = $a \times \frac{2}{a}$	3	3
2.	week 33 B2: $22 = 150 + (n - 1)(-4)$ B1: $22 = a + (n - 1)(-4)$	3	3
3.	$S_{\infty} = \frac{1}{1-m^2}, m^2 \neq 1$ B1: $r = \frac{m^4}{m^2} = m^2$ or $\frac{m^2}{1} = m^2$	2	2
4.	$y = 3x^3 + 4x + 4$ B3: $11 = 3(1)^3 + 4(1) + c$ B2: $\frac{dy}{dx} = 9x^2 + 4$ B1: $\int 18x \, dx = 9x^2 + c$	4	4
5.	$f'(0) = \frac{2}{c}$ B2: $f'(0) = \frac{c(1) - (-c)(1)}{c^2}$ B1: $f'(x) = \frac{g(x)h'(x) - h(x)g'(x)}{[g(x)]^2}$ *(quotient rule)	3	3
6.	(a) $\frac{dA}{dx} = \frac{3}{2}x^2 + 2x$ (b) $0.2p$ B2: $\delta A = \left(\frac{3}{2}(2)^2 + 2(2)\right)(0.02p)$ B1: $\delta x = \frac{2p}{100}$	1 3	4
7.	9 B2: $k^{-1}(x) = \frac{7+(2)}{3-(2)}$ B1: $k^{-1}(x) = \frac{7+(x)}{3-(x)}$	3	3
8.	(a) $f(3) = 3m - 5$ (b) $m = -6$ *($m < 0$) B1: $f^2(x) = m(mx - 5) - 5$	3	3
9.	(a) $0 \leq k < 6$ or $0 \leq k \leq 5$ (b) (i) $4 + v$ (ii) $v = 3$ B1: $1 < 2v - 1 < 6$ or $6 < 2v + 2 < 10$	1 1 2	4

10.	(a) $Q_I = 3$ (b) $Q_I = 25 * (5(3) + 10)$	1 1	2
11.	$y = -\frac{2}{3}x^3 + 2x^2$ B2: $8 = -\frac{2}{3}(-9) + c$ B1: $\frac{y}{x^2} = -\frac{2}{3}x$	3	3
12.	(a) 24 B1: 4! (b) 144 B1: $4(3!)(3!)$ or $4!(3!)$	2 2	4
13.	$\frac{2}{17}$ B2: $\left(\frac{2}{17}\right)\left(\frac{6}{16}\right) + \left(\frac{4}{17}\right)\left(\frac{5}{16}\right)$ B1: $\left(\frac{2}{17}\right)\left(\frac{6}{16}\right)$ or $\left(\frac{4}{17}\right)\left(\frac{5}{16}\right)$	3	3
14.	1 B2: $2^{(2a+8a-10a)}$ B1: $2^{2a} \times 2^{8a} \times 2^{-10a}$	3	3
15.	$x = 1$ or $x = \frac{1}{y}$ B3: $5 \log_x y + 5 = x(5 \log_x y + 5)$ B2: $2 + 2 \log_x y + 3 \log_x x + 3 \log_x y = 5x \log_x x + 5x \log_x y$ B1: $\frac{\log x}{\log xy}$ or $\frac{\log y}{\log xy}$	4	4
16.	(a) $\frac{\pi}{3}$ rad. (b) 13.04439 cm^2 B2: $24\pi - 36\sqrt{3}$ B1: $\left(\frac{1}{2}\right)(12)^2\left(\frac{\pi}{3}\right) - \left(\frac{1}{2}\right)(12)^2 \sin 60^\circ$	1 3	4
17.	$\theta = 0, \frac{2\pi}{3}, \frac{4\pi}{3}, 2\pi$ B3: $\cos \theta = 1, \cos \theta = -\frac{1}{2}$ B2: $(\cos \theta - 1)(2 \cos \theta + 1) = 0$ B1: $2 \cos^2 \theta - 1 = \cos \theta$	4	4
18.	$y = \left(\frac{m-2}{K}\right)^2, K \neq 0$ B1: $K = \frac{m-5}{\sqrt{y}}$	2	2

19.	(a) $b = \pm \sqrt{\left(\frac{2}{21}\right) - \left(\frac{a}{6}\right)}$ B1: $3b^2 + \frac{3}{7} + a + 3b^2 = 1$ (b) $1 - 3b^2$ B1: $1 - P(X=0)$ or $\frac{3}{7} + \left(\frac{4}{7} - 6b^2\right) + 3b^2$	2 2	4
20.	$y = -\frac{5}{12}x + \frac{13}{6}$ B2: $3 = -\frac{5}{12}(-2) + c$ B1: $m = -\frac{5}{12}$	3	3
21.	$AB : BC = 2 : 3$ B2: $k = \frac{2}{5}$ B1: $\sqrt{(0 - (-2))^2 + (4 - 2)^2} = k\sqrt{(3 - (-2))^2 + (7 - 2)^2}$ or $\binom{2}{2} = k \binom{5}{5}$	3	3
22.	$m = 9 - 12n$ B1: $4(3n - 2) + (m - 1) = 0$	2	2
23.	(a) $\overrightarrow{AB} = 4\mathbf{u} - \frac{9}{2}\mathbf{v}$ B1: $\overrightarrow{AB} = \overrightarrow{AO} + \overrightarrow{OB}$ (b) 37 B1: $\sqrt{26^2 + (-k)^2} = 45$	2 2	4
24.	$p = 5$ B2: $p > 4$ B1: $(-2)^2 - 4(1)(p - 3) < 0$	3	3
25.	(a) $a = 12, b = -6$ B1: $y = 2\left(\left(x + \frac{a}{4}\right)^2 - \left(\frac{a}{4}\right)^2\right) + 12$ (b) -6	2 1	3