

2(a)	State or imply that second and fifth terms are $a\cos\theta$ and $a\cos^4\theta$ or $r^3 = \frac{1}{64}$
	Attempt solution of equation of form $\cos^3\theta = k$ as far as $\cos\theta = \dots$, where $0 < k < 1$
	Obtain $\cos\theta = 0.25$, and hence $\theta = 1.32$ only
2(b)	Attempt to find a using <i>their</i> θ and substitute in correct formula for sum to infinity
	Obtain $a = 32$ and use exact value of r to obtain $\frac{128}{3}$
3	x^4 term from $(px + 3)^5$ is $5p^4x^4 \times 3$
	Identify term involving $x^6 \times \frac{p^2}{x^2}$ as relevant term from $\left(x^3 + \frac{p}{x}\right)^4$
	Obtain $6p^2x^4$ or $-6p^2x^4$
	Attempt solution for p^2 of equation that is quadratic in p^2
	Obtain $15p^4 - 6p^2 - 216 = 0$ or equivalent and hence $p = 2$

9(a)	Attempt to express each of $S_2 - 1$, S_4 , S_9 in terms of d (with at least one correct)
	Obtain $S_2 - 1 = 3 + d$, $S_4 = 8 + 6d$, $S_9 = 18 + 36d$
	Attempt equation in d by linking the three values
	Obtain correct $(3 + d) + (18 + 36d) = 2(8 + 6d)$ or equivalent, and hence $d = -\frac{1}{5}$
9(b)	$2 + 14 \times \text{their } d$
	Second progression: obtain either first term = $\frac{14}{5}$ or common difference = 4
	Second progression: attempt to find 15th term
	Obtain 58.8, and hence difference = 59.6

2	$\binom{6}{2} \times (2x^2)^2 \times \left(-\frac{3}{x}\right)^{6-2}$ or $\binom{6}{2} \times 2^6 \times (x^2)^2 \times \left(-\frac{3}{2x}\right)^{6-2}$
	Identifying the relevant term of the form: $k \times (2x^2)^2 \times \left(-\frac{3}{x}\right)^{6-2}$ or $k \times 2^6 \times (x^2)^2 \times \left(-\frac{3}{2x}\right)^{6-2}$
	= 4860

8(a)	$-3c - b = b - a$ or $2b = a - 3c$ or $\frac{b}{a} = \frac{c}{b}$ or $b^2 = ac$ oe
	$4ac = (a - 3c)^2$ or $2\sqrt{ac} = a - 3c$ oe
	$\Rightarrow a^2 - 6ac + 9c^2 = 4ac \Rightarrow a^2 - 10ac + 9c^2 = 0$

8(b)(i)	$81 - 90c + 9c^2 = 0 \Rightarrow [9](c - 9)(c - 1) = 0$ or $\frac{90 \pm \sqrt{5184}}{18} \left[= \frac{90 \pm 72}{18} \right]$
	$c = 1$
	$r^2 = \frac{their 1}{9} \Rightarrow r = \left[\frac{1}{3} \right],$ or $b^2 = their 1 \times 9 \Rightarrow b = 3 \Rightarrow r = \left[\frac{1}{3} \right]$
	$S_{\infty} = \frac{9}{1 - \frac{1}{3}}$
	$S_{\infty} = \frac{27}{2}$ oe

8(b)(ii)	$d = -6$
	$S_{20} = \frac{20}{2}(2 \times 9 + (20-1) \times (-6))$
	$S_{20} = -960$

3(a)	$ar^2 = 18, a + ar + ar^2 = 26$ or $a + ar + 18 = 26$
	$\frac{18}{r^2} + \frac{18}{r} + 18 = 26 \Rightarrow 8r^2 - 18r - 18 = 0 \Rightarrow [(4r+3)(r-3) = 0]$
	$r = -\frac{3}{4}$ [or $r = 3$]
	$a = 32$
	Tenth term = -2.40
	Alternative Method for first three marks in Question 3(a)
	$ar^2 = 18, 26 = \frac{a(1-r^3)}{1-r}$
	$26 = \frac{\frac{18}{r^2}(1-r^3)}{1-r} \Rightarrow 8r^3 - 26r^2 + 18 = 0$
	$r = -\frac{3}{4}$ [or $r = 3, 1$]
3(b)	$S_{\infty} = \frac{32}{1 - \left(-\frac{3}{4}\right)}$
	$\frac{128}{7}$

5(a)(i)	$32 - 80px + 80p^2x^2$
5(a)(ii)	$1 - 2x + \frac{3}{2}x^2$
5(b)	Coefficient of $x^2 = 32 \times \frac{3}{2} + (-2 \times -80p) + 80p^2$
	$48 + 160p + 80p^2 = 93 \Rightarrow 5(4p + 9)(4p - 1) [= 0]$
	$p = -\frac{9}{4}$ and $p = \frac{1}{4}$

3	$\binom{5}{3}$ or $\binom{5}{2}$ or $10 \times (px^2)^{5-3} \times \left(\frac{4}{p}x\right)^3$
	$10p^2 \times \frac{64}{p^3}$
	$\frac{\text{Their integer } k}{p} [x^7] = 1280[x^7]$
	$p = \frac{1}{2}$
10(a)(i)	$8k - k^2 = k^2 - 4k$ or $2k^2 = 4k + 8k$ or $4k + 2(k^2 - 4k) = 8k$
	$[2k(k - 6) = 0 \Rightarrow] k = 6$ [or $k = 0$]

10(a)(ii)	$d \left[= 8k - k^2 \text{ or } 2k \text{ or } k^2 - 4k \right] = 12 \text{ and } a \left[= 4k \right] = 24$
	$S_{20} = \frac{20}{2} (2 \times 24 + 19 \times 12) \text{ or } = \frac{20}{2} (24 + 252)$
	$S_{20} = 2760$
10(b)	$ar^3 = 36 \text{ and } ar^5 = 6$ or $r^2 = \frac{1}{6}$
	$r = \sqrt{\frac{6}{36}} \left[= \frac{1}{\sqrt{6}} \text{ or } \frac{\sqrt{6}}{6} \right]$
	$a = \frac{36}{\left(\frac{1}{\sqrt{6}} \right)^3} \left[= 36 \times \sqrt{6}^3, 216\sqrt{6} \text{ or } \frac{1296}{\sqrt{6}} \right]$
	$S_{\infty} = \frac{216\sqrt{6}}{1 - \frac{1}{\sqrt{6}}}$
	$[S_{\infty} =] \frac{1296}{\sqrt{6} - 1} \text{ or } \frac{7776}{\sqrt{216} - 6}$