Question			Answer	Marks	AO	Guidance	
4	(a)		GP: $x,\ \frac{15}{y},\ z \Rightarrow \frac{\frac{15}{y}}{x} = \frac{z}{\frac{15}{y}}$	**M1***	**3.1a**	**M1** for un-simplified correct use of $r = \frac{u_n}{u_{n-1}}$ so allow this mark for stating that $r = \frac{15}{xy}$ or $r = \frac{yz}{15}$ or $r^2x = z$ oe	Or for the terms of the GP as $y+4,\ \frac{15}{y},\ y-4$ in y only
			AP: $x, y, z \Rightarrow y - x = -4$ or $z - y = -4$	**M1***	**1.1**	**M1** for $y - x = \pm 4$ or $z - y = \pm 4$ or $z - x = \pm 8$ oe For reference: $xy^2z = 225$, $x = y + 4$ and $z = y - 4$	Or for the terms of the AP as $y+4,\ y,\ y-4$ in y only
			$(y+4)y^2(y-4) = 225$	**M1dep***	**1.1**	Eliminate x and z to form an equation in y only (must be equivalent to a quartic in y)	Or for $\frac{y-4}{\frac{15}{y}} = \frac{\frac{15}{y}}{y+4}$ $\left(\Rightarrow y^2 - 16 = \frac{225}{y^2}\right)$
			$y^2(y^2 - 4y + 4y - 16) = 225 \Rightarrow y^4 - 16y^2 - 225 = 0$	**A1**	**2.2a**	**AG** so sufficient working must be shown www – note that $y = x + 4$ and $y = z - 4$ (from $d = +4$) can lead to the correct equation (which can score the **M** marks only)	
				[4]			

Question			Answer	Marks	AO	Guidance	
4	(b)		$y^4 - 16y^2 - 225 = 0 \Rightarrow y = \pm 5$ but $y > 0 \Rightarrow y = 5$	B1	1.1	**BC** Allow implied e.g. $y = \pm 5$ then using $y = 5$ only (**B0** if the sum to infinity for other values of y are not rejected)	$x = 9, z = 1$
			$\Rightarrow r^2 = \frac{z}{x} = \frac{1}{9} \Rightarrow r = \frac{1}{3}$	M1	1.1	Calculate r (soi) corresponding to $y = 5$ allow unsimplified e.g. $r = \frac{(5)(1)}{15}$ and allow if more than one value of y stated	Possibly done implicitly in formula for S_∞
			$S_\infty = \frac{x}{1-r} = \frac{9}{\frac{2}{3}}$	M1	1.1	Using the correct formula for the sum to infinity of a GP with their value of x ($=$ their $y \pm 4$) and a value of r where $-1 < r < 1$	
			$S_\infty = 13.5$	A1	1.1	cao oe eg $\frac{27}{2}$ - do not award this mark if more than one value for S_∞ stated	**A0** for a triple-decker fraction e.g. $\frac{9}{\frac{2}{3}}$
				[4]			