ALT 1: finding *h* first using the ratio

24	$\sqrt{4} : \sqrt{9}$ (= 2 : 3) or $\sqrt{9} : \sqrt{4}$ (= 3 : 2) oe or $\frac{\sqrt{4}}{\sqrt{9}}\left(=\frac{2}{3}\right)$ oe or $\frac{\sqrt{9}}{\sqrt{4}}\left(=\frac{3}{2}\right)$ oe		5	M1	for a correct method to find the length scale factor, may be seen as a ratio or a fraction may be seen embedded in a method to find the volume scale factor. NB a correct volume scale factor (as a ratio or a fraction) implies this mark, eg 8 : 27 or $\frac{8}{27}$
	(h_1 =) $\frac{"2"}{"2"+"3"} \times 30$ (= 12) or (h_2 =) $\frac{"3"}{"2"+"3"} \times 30$ (= 18) **or** (Volume of $\mathbf{C}_2$ =) $\left("\frac{3}{2}"\right)^3 \times 23.04\pi \left(=\frac{1944}{25}\pi = 77.76\pi = 244.2(90...)\right)$			M1	for correct method to find the height of one of the cones **or** for a correct method to find the volume of $\mathbf{C}_2$ h_1 and h_2 are the heights of $\mathbf{C}_1$ and $\mathbf{C}_2$ respectively implies previous M mark
	eg (Volume of $\mathbf{C}_1$ in terms of r_1:) $\frac{1}{3} \times \pi \times r_1^2 \times "12" = 23.04\pi$ oe **or** (Volume of $\mathbf{C}_1$ in terms of r_2:) $\frac{1}{3} \times \pi \times \left("\frac{2}{3}" \times r_2\right)^2 \times "12" = 23.04\pi$ oe **or** (Volume of $\mathbf{C}_2$ in terms of r_2:) $\frac{1}{3} \times \pi \times r_2^2 \times "18" = "77.76\pi"$ oe **or** (Volume of $\mathbf{C}_2$ in terms of r_1:) $\frac{1}{3} \times \pi \times \left("\frac{3}{2}" \times r_1\right)^2 \times "18" = "77.76\pi"$ oe			M1	for forming a correct equation in one variable common factors of π may be omitted r_1 and r_2 are the base radii of $\mathbf{C}_1$ and $\mathbf{C}_2$ respectively
	eg $r_1 = \sqrt{\frac{3 \times 23.04\pi}{"12" \times \pi}}$ (= 2.4) or $r_2 = \sqrt{\frac{3 \times "77.76\pi"}{"18" \times \pi}}$ oe			M1	dep on M3 for a complete method to find the radius of the base of one of the cones
	Working required	3.6		A1	dep on M3, accept equivalents eg $\frac{18}{5}$ or $3\frac{3}{5}$
					Total 5 marks

ALT 2: simultaneous equations

24	$\sqrt{4} : \sqrt{9}$ (= 2 : 3) or $\sqrt{9} : \sqrt{4}$ (= 3 : 2) oe or $\frac{\sqrt{4}}{\sqrt{9}}\left(=\frac{2}{3}\right)$ oe or $\frac{\sqrt{9}}{\sqrt{4}}\left(=\frac{3}{2}\right)$ oe		5	M1	for a correct method to find the length scale factor , may be seen as a ratio or a fraction may be seen embedded in a method to find the volume scale factor. NB a correct volume scale factor (as a ratio or a fraction) implies this mark, eg 8 : 27 or $\frac{8}{27}$
	eg $\frac{1}{3}\times\pi\times r_1^2\times h = 23.04\pi$ **or** $r_1^2 h = 69.12$ oe **or** $\frac{27}{8}\times\frac{1}{3}\times\pi\times r_1^2\times h = \frac{1}{3}\times\pi\times r_2^2\times(30-h)$ **or** (Volume of $\mathbf{C}_2$ =) $\left("\frac{3}{2}"\right)^3\times 23.04\pi\ \left(=\frac{1944}{25}\pi = 77.76\pi = 244.2(90...)\right)$			M1	dep on M1 for a correct equation linking the radius and height of $\mathbf{C}_1$ **or** for a correct equation linking the radius and heights of both cones (h and $30 - h$ may be interchanged) **or** for a correct method to find the volume of $\mathbf{C}_2$ h is the height of one of the cones r_1 and r_2 are the base radii of $\mathbf{C}_1$ and $\mathbf{C}_2$ respectively
	eg $\frac{3}{2}\times"69.12" = \frac{"69.12"}{h}\times(30-h)$ oe **OR** $\frac{27}{8}\times r_1^2\times\frac{"69.12"}{r_1^2} = \left(\frac{3}{2}r_1\right)^2\times\left(30-\frac{"69.12"}{r_1^2}\right)$ oe			M1	uses two correct equations **and** $r_2 = \frac{3}{2}r_1$ oe to form a correct equation in one variable only the variable should represent the radius or height of one of the cones
	eg $\frac{3}{2}\times"69.12" = \frac{"69.12"}{h}\times(30-h)$ oe leading to $h = \ldots$ **OR** $\frac{27}{8}\times r_1^2\times\frac{"69.12"}{r_1^2} = \left(\frac{3}{2}r_1\right)^2\times\left(30-\frac{"69.12"}{r_1^2}\right)$ oe leading to $r_1 = \ldots$			M1	dep on M3 for a complete method to solve their equation to find the height or radius of one of the cones implied by a correct value eg (r_1 =) 2.4 or (r_2 =) 3.6 or (h =) 12 or 18
	Working required	3.6		A1	dep on M3, accept equivalents eg $\frac{18}{5}$ or $3\frac{3}{5}$
					Total 5 marks