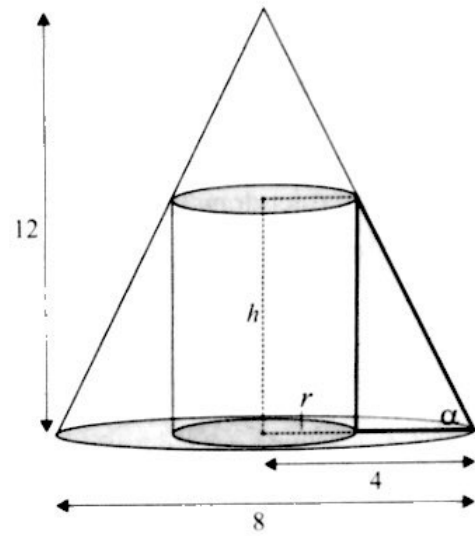
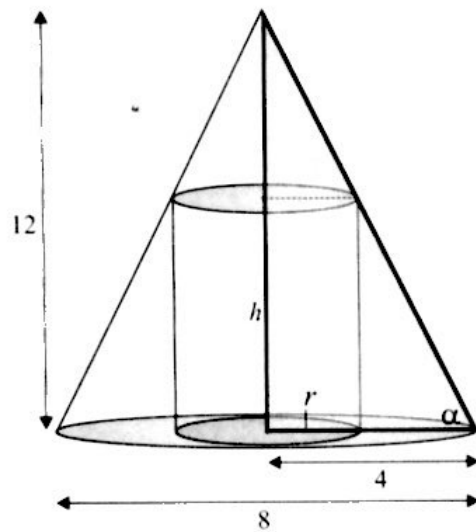


QUESTION 3 (25 MARKS)



Question 3 (a)

The two highlighted triangles are similar triangles.

$$\frac{12}{4} = \frac{h}{4-r}$$

$$3 = \frac{h}{4-r}$$

$$\therefore 12 - 3r = h$$

Question 3 (b)

$$V = \pi r^2 h = \pi r^2 (12 - 3r) = 24\pi$$

$$12r^2 - 3r^3 = 24$$

$$r^3 - 4r^2 + 8 = 0$$

Question 3 (c)

$$f(r) = r^3 - 4r^2 + 8$$

$$f(1) = 1 - 4 + 8 \neq 0$$

$$f(2) = 8 - 16 + 8 = 0$$

$$\therefore r = 2$$

$$h = 12 - 3r$$

$$\therefore h = 12 - 6 = 6$$