9 **(a)** Solve the equation $\sqrt{8-4x}+\sqrt{2-x}=3x$. [4]

(b) A cuboid of volume $\left(54-11\sqrt{3}\right)$ cm^3 has a base area $\left(7+2\sqrt{3}\right)$ cm^2 and height h cm. **Without using a calculator**, obtain an expression for h in the form $a+b\sqrt{3}$, where a and b are integers. [4]

9 **(a)** Solve the equation $\sqrt{8-4x}+\sqrt{2-x}=3x$. [4]

$$\sqrt{8-4x}+\sqrt{2-x}=3x$$

$$2\sqrt{2-x}+\sqrt{2-x}=3x \quad \text{common}$$

$$3\sqrt{2-x}=3x$$

$$\sqrt{2-x}=x$$

$$2-x=x^2 \quad \text{square both sides}$$

$$x^2+x-2=0$$

$$(x+2)(x-1)=0$$

$$x=-2 \text{ or } x=1 \text{ // Ans}$$

(b) A cuboid of volume $\left(54-11\sqrt{3}\right)$ cm^3 has a base area $\left(7+2\sqrt{3}\right)$ cm^2 and height h cm.

Without using a calculator, obtain an expression for h in the form $a+b\sqrt{3}$, where a and b are integers. [4]

$$h=\frac{54-11\sqrt{3}}{7+2\sqrt{3}}$$

$$=\frac{54-11\sqrt{3}}{7+2\sqrt{3}}\times\frac{7-2\sqrt{3}}{7-2\sqrt{3}}$$

$$=\frac{378-108\sqrt{3}-77\sqrt{3}+(22)(3)}{(7)^2-(2\sqrt{3})^2}$$

$$=\frac{444-185\sqrt{3}}{49-12}$$

$$=\frac{444-185\sqrt{3}}{37}=12-5\sqrt{3} \text{ // Ans.}$$