

9)

$$\frac{\pi}{5} + \frac{\pi}{5} + \frac{3\pi}{5} = 180^\circ$$

$$\frac{5\pi}{5} = 180^\circ$$

$$\pi = 180^\circ$$

if $\pi = 180^\circ$, then $\angle DCA = \frac{\pi}{5} = 36^\circ$

$$\angle DAC = \frac{2\pi}{5} = 72^\circ$$

$$\therefore \angle ACD = \frac{2\pi}{5} = 72^\circ$$

$$36^\circ + 72^\circ + 72^\circ = 180^\circ$$

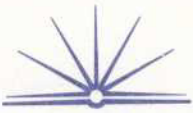
$$\therefore \angle ADC = 72^\circ$$

$$BA = DC = 1$$

$$\angle ABD \parallel \angle ADC = 2:1$$

$$\angle BAD = \angle ACD = 72^\circ$$

$\therefore \triangle ABD$ and $\triangle ABC$ are similar as two Angles
are in a common ratio.



$$i) x^2 - x - 1 = 0$$

$$iii) \cos \frac{\pi}{5} = \frac{1 + \sqrt{5}}{4}$$

$$\cos A = \frac{b^2 + c^2 - a^2}{2a}$$

~~$$\cos A = \frac{b^2 + c^2 - a^2}{2}$$~~

b)

$$\frac{dV}{dt} = 2e^t + 2e^{-t}$$

$$i) \frac{dV}{dt} = 2e^{(1)} + 2e^{(-1)}$$

$$\frac{dV}{dt} = 2e + 2e^{-1}$$

$$= 6.17 \text{ L/h}$$

$$ii) V = 2e^t - 2e^{-t}$$

$$iii) 2e^{2t} - 3e^t - 2 = 0 \quad \text{when } V = 3$$

$$2e^t - 2e^{-t} = 3$$

$$2e^t - 3e^{-t} - 2 = 0$$

$$\therefore 2e^t - 3e^t - 2 = 0$$

$$\text{iv) } V = 2e^t - 2e^{-t}$$

when $V = 3 \dots t = ?$

$$3 = 2e^t - 2e^{-t}$$

$$\frac{3}{2} = e^t - e^{-t}$$

$$\ln \frac{3}{2} = 2t$$

$$t = \frac{\ln \frac{3}{2}}{2}$$

$$t = 0.203 \text{ minutes.}$$