

4th Exercise:1. $(\sqrt{5}-1)$ is a solution of $p(x)$ then, $p(\sqrt{5}-1) = 0$

$$\Rightarrow (\sqrt{5}-1)^2 + 3(\sqrt{5}-1) - m = 0$$

$$5 - 2\sqrt{5} + 1 + 3\sqrt{5} - 3 - m = 0$$

$$3 + \sqrt{5} - m = 0$$

$$\therefore m = 3 + \sqrt{5} \text{ so, choice (a)}$$

$$2. A = \frac{10^{-2} + 10^2}{10^2} = \frac{10^{-2}}{10^2} + \frac{10^2}{10^2} = \frac{1}{10^4} + 1 = 1 + 0.0001 = 1.0001 \text{ (c)}$$

3. $(\frac{1}{2})$ is a root of $p(x)$ then $p(\frac{1}{2}) = 0$

$$\Rightarrow (3(\frac{1}{2}) - a)(2(\frac{1}{2}) + a) = 0$$

$$\frac{3}{2} - a = 0 \quad \underline{\text{or}} \quad 1 + a = 0$$

$$\therefore a = \frac{3}{2} \quad \text{or} \quad a = -1 \quad \text{so, choice (a)}$$

$$4. A = \sqrt{6} \sqrt{1 - \frac{\sqrt{5}}{3}}$$

$$\text{then } A^2 = \left[\sqrt{6} \sqrt{1 - \frac{\sqrt{5}}{3}} \right]^2 = 6 \left(\sqrt{\frac{3-\sqrt{5}}{3}} \right)^2 = 6 \left(\frac{3-\sqrt{5}}{3} \right) = 2(3-\sqrt{5})$$

$$\boxed{A^2 = 6 - 2\sqrt{5}}$$

$$C = (\sqrt{5}-1)^2 = 5 - 2\sqrt{5} + 1 = 6 - 2\sqrt{5}$$

$$\therefore A^2 = C \quad \text{so, choice (a)}$$

$$5. E = \frac{8^{10} + 4^{10}}{8^4 + 4^{11}} = \frac{(2^3)^{10} + (2^2)^{10}}{(2^3)^4 + (2^2)^{11}} = \frac{2^{30} + 2^{20}}{2^{12} + 2^{22}} = \frac{2^{20}(2^{10} + 1)}{2^{12}(2^{10} + 1)}$$

$$\therefore E = 2^8$$

so, choice (b)