

1(i)

$$\text{let } p(x) = x^3 - 4x^2 + 5x - 2$$

$$p(2) = 2^3 - 4 \times 2^2 + 5 \times 2 - 2$$

$$= 8 - 16 + 10 - 2$$

$$= 18 - 18$$

$$= 0$$

$\therefore 2$ is a zero of $p(x)$

$$p(1) = 1^3 - 4 \times 1^2 + 5 \times 1 - 2$$

$$= 1 - 4 + 5 - 2$$

$$= 6 - 6$$

$$= 0$$

$\therefore 1$ is a zero of $p(x)$

$$\text{Sum of zeros} = 2 + 1 + 1$$

$$= \frac{4}{1}$$

$$= -\frac{(-4)}{1}$$

$$= -\frac{b}{a}$$

$$\left[\begin{array}{l} b = -4 \\ a = 1 \end{array} \right]$$

$$\text{Product of zeros} = 2 \times 1 \times 1$$

$$= \frac{2}{1}$$

$$= -\frac{(-2)}{1}$$

$$= -\frac{d}{a} \left[\begin{array}{l} \because d = -2 \\ a = 1 \end{array} \right]$$

Sum of product taking two at a time

$$= 2 \times 1 + 1 \times 1 + 1 \times 2$$

$$= \frac{5}{1}$$

$$= \frac{c}{a} \left[\begin{array}{l} \because c = 5 \\ a = 1 \end{array} \right]$$

$$\textcircled{2} \text{ Sum of zeros (S)} = \frac{2}{1} = -\frac{(-2)}{1} = -\frac{b}{a}$$

$$\text{Product of zeros (P)} = -\frac{14}{1} = -\frac{d}{a}$$

Sum of product taking

$$\text{two at a time (SP)} = -\frac{7}{1}$$

$$= \frac{c}{a}$$

$$\therefore a = 1, b = -2, c = -7$$

$$d = 14$$

required polynomial

$$x^3 - 2x^2 - 7x + 14$$