

2. The roots of the equation

$$2x^3 - 3x^2 + 12x + 7 = 0$$

are α , β and γ

Without solving the equation,

(a) write down the value of each of

$$\alpha + \beta + \gamma \qquad \alpha\beta + \alpha\gamma + \beta\gamma \qquad \alpha\beta\gamma \qquad (1)$$

(b) Use the answers to part (a) to determine the value of

(i) $\frac{2}{\alpha} + \frac{2}{\beta} + \frac{2}{\gamma}$

(ii) $(\alpha - 1)(\beta - 1)(\gamma - 1)$

(iii) $\alpha^2 + \beta^2 + \gamma^2$

(7)