

6 (i) Factorise $2x^3 + 3x^2 - 8x - 12$.

[3]

(ii) Hence solve the equation $\frac{x^3}{4} + \frac{3}{4}x^2 - 4x - 12 = 0$.

[3]

6 (i) Factorise $2x^3 + 3x^2 - 8x - 12$.

[3]

When $x=2$, $2(2)^3 + 3(2)^2 - 8(2) - 12 = 0$

$\therefore (x-2)$ is a factor.

$$(x-2) \overline{) \begin{array}{r} 2x^3 + 7x + 6 \\ 2x^3 + 3x^2 - 8x - 12 \\ \hline 2x^3 - 6x^2 \end{array}}$$

$$7x^2 - 8x$$

$$\underline{7x^2 - 14x}$$

$$6x - 12$$

$$\underline{6x - 12}$$

$$\underline{0}$$

$$\begin{aligned} \therefore 2x^3 + 3x^2 - 8x - 12 \\ = (x-2)(2x^2 + 7x + 6) \\ = (x-2)(x+2)(2x+3) \end{aligned}$$

Ans

(ii) Hence solve the equation $\frac{x^3}{4} + \frac{3}{4}x^2 - 4x - 12 = 0$.

[3]

Hint $2x^3 + 3x^2 - 8x - 12$.

if you compare this two equations, you will find that it is halved the top question.

Using $2x^3 + 3x^2 - 8x - 12 = (x-2)(x+2)(2x+3)$
 Compare with: $\frac{x^3}{4} + \frac{3}{4}x^2 - 4x - 12 = 0$

$$2\left(\frac{x}{2}\right)^3 + 3\left(\frac{x}{2}\right)^2 - 4\left(\frac{x}{2}\right) - 12 = 0$$

$$\left(\frac{x}{2} - 2\right)\left(\frac{x}{2} + 2\right)(x+3) = 0$$

$\therefore x = -4, x = 4$ or $x = -3$ *Ans*