

8. Given $A(x-2)^3 + B(x-2)^2 + C(x-2) + D = 2x^3 + 8x^2 + 22x + 22$ find the values of A, B, C and D.

Solution:

$$\begin{aligned}x &= 2 & D &= 2(8) + 8(4) + 22(2) + 22 \\&&&= 16 + 32 + 44 + 22 = 114\end{aligned}$$

Equate the coefficient of x^3

$$A = 2$$

Equate the coefficient of x^2

$$\begin{aligned}A(-6) + B &= 8 \\B &= 20\end{aligned}$$

Put $x = 0$

$$\begin{aligned}A(-8) + B(4) + C(-2) + D &= 22 \\-16 + 8 - 2C + 114 &= 22 \\-2C &= -156 \\C &= 78\end{aligned}$$

$$\therefore A = 2, B = 20, C = 78, D = 114.$$