$$y = b\frac{x^{(2)}}{2} + c\frac{x^{(1)}}{1} + k$$

$$y = \frac{b}{2}x^{(2)} + cx + k$$

(vii) $\cos x$ with π as difference in interval.

Ans:

$$\Delta f(x) = \cos x$$

let $f(x) = A\cos x + B$.

$$\therefore \Delta f(x) = A\{\cos(x+\pi) - \cos x\}$$

$$= 2A \sin\left(\frac{\pi}{2} + x\right) \sin\left(\frac{\pi}{2}\right)$$

$$= -2A\cos x$$

But given $\Delta f(x) = \cos x$.

$$\therefore -2A\cos x = \cos x$$

$$-2A = 1$$

$$\therefore \boxed{A = -\frac{1}{2}}$$

So $f(x) = -\frac{1}{2}\cos x + B$

3) Represent the function $11x^4 + 5x^3 + 2x^2 + x - 15$ and its sucessive difference in factorial notation.

Ans: