

$$\frac{1}{(x-2)^2(x+3)} \equiv \frac{A}{x-2} + \frac{B}{(x-2)^2} + \frac{C}{x+3}$$

$$\equiv \frac{A(x-2)(x+3) + B(x+3) + C(x-2)^2}{(x-2)^2(x+3)}$$

$$1 \equiv A(x-2)(x+3) + B(x+3) + C(x-2)^2$$

$$1 \equiv A(x^2 + x - 6) + B(x+3) + C(x^2 - 4x + 4) \quad *$$

putting $x = 2$

$$1 \equiv 0 + B(2+3) + 0$$

$$1 \equiv 5B, \quad \therefore \underline{B = \frac{1}{5}}$$

putting $x = -3$

$$1 \equiv 0 + 0 + C(-5)^2$$

$$1 \equiv 25C, \quad \therefore \underline{C = \frac{1}{25}}$$

equating coefficients of x^2 from *

$$0 = A + C, \quad A = -C, \quad \therefore \underline{A = -\frac{1}{25}}$$

$$\frac{1}{(x-2)^2(x+3)} \equiv -\frac{1}{25(x-2)} + \frac{1}{5(x-2)^2} + \frac{1}{25(x+3)}$$
