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

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

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

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

putting $\quad x = 2$

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

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

putting $\quad x = -3$

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

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

equating coefficients of x^2 from *

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

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