



Air maths tuition

Interact, engage and perform

Partial Fractions - Calculating Constants - 3 linear factors (summary example)

Express $\frac{x+2}{x(x+3)(2x-1)}$ in partial fractions

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

$$\therefore x+2 \equiv A(x+3)(2x-1) + Bx(2x-1) + Cx(x+3)$$

when $x=0$

$$\therefore 2 = A(3)(-1)$$

$$\therefore A = -\frac{2}{3}$$

when $x=-3$

$$\therefore -1 = B(-3)(-7)$$

$$\therefore B = -\frac{1}{21}$$

when $x=\frac{1}{2}$

$$\therefore \frac{5}{2} = C\left(\frac{1}{2}\right)\left(\frac{7}{2}\right)$$

$$\therefore C = \frac{10}{7}$$

$$\therefore \frac{x+2}{x(x+3)(2x-1)} \equiv \frac{10}{7(2x-1)} - \frac{2}{3x} - \frac{1}{21(x+3)}$$



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