

$$1) (11-3x) / (x^2+2x-3)$$

$$\frac{11-3x}{x^2+2x-3}$$

$$\frac{11-3x}{x^2+2x-3} = \frac{11-3x}{(x-1)(x+3)}$$

$$11-3x = A(x+3) + B(x-1)$$

$$\text{let } x-1=0 \Rightarrow x=1$$

$$11-3(1) = A(1+3) + B(1-1)$$

$$11-3 = 4A$$

$$8 = 4A$$

$$A = 2$$

$$\text{let } x+3=0 \Rightarrow x=-3$$

$$11-3(-3) = A(-3+3) + B(-3-1)$$

$$11+9 = -4B$$

$$20 = -4B$$

$$B = -5$$

$$2) (2x^2-9x-35) / (x+1)(x-2)(x+3)$$

$$\frac{2x^2-9x-35}{(x+1)(x-2)(x+3)} = \frac{A}{(x+1)} + \frac{B}{(x-2)} + \frac{C}{(x+3)}$$

$$2x^2-9x-35 = A(x-2)(x+3) + B(x+1)(x+3) + C(x+1)(x-2)$$

$$\text{let } x+1=0 \Rightarrow x=-1$$

$$2(-1)^2-9(-1)-35 = A(-1-2)(-1+3)$$

$$2+9-35 = -6A$$

$$10-35 = -6A$$

$$-25 = -6A$$

$$A = \frac{25}{6}$$

$$\text{let } (x-2)=0 \Rightarrow x=2$$

$$2(2)^2-9(2)-35 = B(2+1)(2+3)$$

$$2(-3) - 35 = 15B$$

$$-45 = 15B$$

$$B = -3$$

$$\text{let } x+3=0 \Rightarrow x=-3$$

$$2(-3)^2 - 9(-3) - 35 = C(3+1)(-3-2)$$

$$18 + 27 - 35 = 10C$$

$$10C = 10C$$

$$C = 1$$

$$\frac{2x^2 - 9x - 35}{(x+1)(x-2)(x+3)} = \frac{25}{(x+1)} - \frac{3}{(x-2)} + \frac{1}{(x+3)}$$

$$\int \frac{2x^2 - 9x - 35}{(x+1)(x-2)(x+3)} = \int \frac{25}{(x+1)} - \int \frac{3}{(x-2)} + \int \frac{1}{x+3} + C$$

$$3) \int \frac{1}{(x^2+121)}$$

$$\frac{1}{(x^2+121)} = \int \frac{1}{(x+11)^2} = \int (x+11)^{-2}$$
$$= \frac{(x+11)^{-1}}{-1}$$

$$= -\frac{1}{(x+11)} + C$$

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