

PARTIAL FRACTIONS

Decompose $\frac{4p^2+13p-12}{p^3-p^2-2p}$ into partial fractions.

$$\begin{array}{l} \text{Factor } p^3-p^2-2p = p(p^2-p-2) \\ \text{Denominator} \qquad \qquad \qquad p(p-2)(p+1) \end{array}$$

$$4p^2+13p-12 = \frac{A}{p} + \frac{B}{p-2} + \frac{C}{p+1}$$

$$A(p-2)(p+1) + B(p+1)(p) + C(p-2)(p)$$

Choose values for 'p' to eliminate A, B ^{and} or C

$$p=0$$

$$\begin{aligned} 4(0)^2 + 13(0) - 12 &= A(0-2)(0+1) + B(0) + C(0) \\ -12 &= -2A \qquad A=6 \end{aligned}$$

$$p=-1$$

$$\begin{aligned} 4(-1)^2 + 13(-1) - 12 &= A(0) + B(0) + C(-1-2)(-1) \\ -21 &= 3C \qquad C=-7 \end{aligned}$$

$$p=2$$

$$\begin{aligned} 4(2)^2 + 13(2) - 12 &= A(0) + B(2+1)(2) + C(0) \\ 30 &= 6B \qquad B=5 \end{aligned}$$

$$\frac{6}{p} + \frac{5}{p-2} - \frac{7}{p+1}$$