Recap

Partial Fractions 2

Repeated Linear Factors

Given that

$$\frac{3+2x^2}{(1+x)^2(1-4x)} = \frac{A}{1+x} + \frac{B}{(1+x)^2} + \frac{C}{1-4x},$$

where A, B and C are constants, find B and C, and show that $A = 0$.

$3 + 2x^2 = A(1+x)(1-4x) + B(1-4x) + C(1+x)^2$

$x = -1$ $\quad 3 + 2(-1)^2 = B(1 - 4(-1))$

$5 = 5B$ $\qquad B = 1$

$x = \frac{1}{4}$ $\quad 3 + 2\left(\frac{1}{4}\right)^2 = C\left(1 + \frac{1}{4}\right)^2$

$\frac{25}{8} = \frac{25}{16}C$

$\frac{\cancel{25}^{1}}{\cancel{8}_{1}} \times \frac{16^{2}}{\cancel{25}_{1}} = C$

$2 = C$ $\qquad C = 2$

coeff of x^2 $\quad 2 = -4A + C$

$2 = -4A + 2$

$2 - 2 = -4A$

$0 = -4A$ $\qquad A = 0$

$0 = A$