Applying Algebraic skills to Partial Fractions

AH Mathematics HW

Essential knowledge:

1. Express each of the following in partial fractions:

(a) $\frac{3-8x}{x-x^2}$ *Linear*

(b) $\frac{3x+10}{x^2+6x+9}$ *Repeated*

(c) $\frac{5x^2-x+6}{x^3+3x}$ *Irreducible*

2. Express $\frac{x^2}{(x-1)^2}$ in the form $A+\frac{B}{x-1}+\frac{C}{(x-1)^2}$

Unit level:

3. Find partial fractions for the following rational functions:

(a) $\frac{7x+1}{x^2+x-6}$

(b) $\frac{3x+5}{(x+1)(x+2)(x+3)}$

(c) $\frac{1}{x^3+x}$

Assessment level:

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

5. Express $\frac{2x^2-9x-6}{x(x^2-x-6)}$ in partial fractions.

6. Reduce the improper function $\frac{x^4+1}{x^3+2x}$ into a polynomial function plus partial fractions

7. Express $\frac{x^3+2x^2+61}{(x+3)^2(x^2+4)}$ in partial fractions.

Challenge Questions (optional)

1. Which of the following has the largest value?

A $\frac{\left(\frac{1}{2}\right)}{\left(\frac{3}{4}\right)}$ **B** $\frac{1}{\left(\frac{\frac{2}{3}}{\frac{3}{4}}\right)}$ **C** $\frac{\left(\frac{\frac{1}{2}}{3}\right)}{4}$ **D** $\frac{1}{\left(\frac{\frac{2}{3}}{\frac{3}{4}}\right)}$ **E** $\frac{\left(\frac{\frac{1}{2}}{\frac{3}{4}}\right)}{4}$

2. Given that $\frac{3x+y}{x-3y} = -1$, what is the value of $\frac{x+3y}{3x-y}$?

A -1 **B** 2 **C** 4 **D** 5 **E** 7