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A LEVEL MATHS

(5) Partial Fractions Requiring Algebraic Division

WORKING AT D/E

(1) Circle **all** of the fractions below that are improper.

$$\frac{x^2+2x+1}{2x^2-3x-7} \quad \frac{x^3-x}{x^4+x+12} \quad \frac{x^2+6x+2}{x-5} \quad \frac{3x^2-x}{x(x^2+9)}$$

(2) Show that

$$\frac{2x^2-2x-16}{(x+1)(x-3)} \equiv A + \frac{B}{(x+1)} + \frac{C}{(x-3)}$$

where A, B and C are integers to be found.

(3) Use algebraic division to show that

$$\frac{x^3-x^2-17x+20}{(x-4)}$$

Can be written in the form $(x-4) \times f(x)$

WORKING AT B/C

(1) (a) Use polynomial division to show that $\frac{3x^2+22x+}{x^2+3x-18}$ can be written as:

$$3 + \frac{13x+60}{(x+6)(x-3)}$$

(b) Hence, express $\frac{3x^2+20x+12}{x^2+3x-18}$ in the form

$$3 + \frac{A}{(x+6)} + \frac{B}{(x-3)}.$$

(2) (a) Use polynomial division to show that

$$\frac{3x^2-23x+32}{x^2-5x-14}$$

can be written in the form $A + \frac{74-8x}{(x-7)(x+2)}$

(b) Hence, express $\frac{3x^2-23x+32}{x^2-5x-14}$ in partial fractions

WORKING AT A*/A

(1) Express:

$$\frac{4x^3+x^2+2x-2}{x^2(x-1)}$$

In partial fractions. You must show full workings.

(2) Express $\frac{9x^2+1}{9x^2-1}$ in partial fractions.

You must show full workings.