YEAR 2 PURE

ALGEBRAIC METHODS

Chapter 1

- PROOFS

Step 1: Make an assumption - the greatest odd integer is n

Step 2: Show contradiction - $n+2$

Step 3: Conclusion - there is no greatest odd integer

- ALGEBRAIC FRACTIONS (normal fraction rules apply)

$$\frac{3x+5}{x^2+x-12} - \frac{2}{x-3}$$

$$= \frac{3x+5}{(x+4)(x-3)} - \frac{2}{(x-3)}$$ Factorise if possible

$$= \frac{3x+5}{(x+4)(x-3)} - \frac{2(x+4)}{(x-3)(x+4)}$$ common denominator needed

$$= \frac{3x+5-2x-8}{(x+4)(x-3)}$$ write as single fraction

$$= \frac{x+3}{(x+4)(x+3)}$$ simplify if possible

$$= \frac{1}{(x+4)}$$ cancel any common factors

- PARTIAL FRACTIONS

Type A: $\frac{6x+2}{(x-3)(x+1)} = \frac{A}{(x-3)} + \frac{B}{(x+1)}$

hence $6x+2 = A(x+1) + B(x-3)$

then Let $x=1$ and $x=3$

Type B:

$$\frac{11x^2+14x+5}{(x+1)^2(2x+1)} = \frac{A}{(x+1)} + \frac{B}{(x+1)^2} + \frac{C}{2x+1}$$

hence $11x^2+14x+5 = A(x+1)(2x+1) + B(2x+1) + C(x+1)^2$

then Let $x=-1$, $x=-\frac{1}{2}$ and $x=0$

- IMPROPER FRACTION

power of numerator is equal or greater than the power of the denominator

$$\frac{3x^2-3x-2}{(x-1)(x-2)} = A + \underbrace{\frac{B}{(x-1)} + \frac{C}{(x-2)}}_{\text{remainder}}$$

Whole Number