GCSE HIGHER · REVISION MAT 5

Simplifying, expanding & factorising

1 Simplify

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

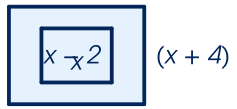
2 Factorise

$$4x^2 - 25$$

3 Show that

$$(x + 2)(x + 5) - (x + 1)(x + 6) = 4$$

4 A picture has a border.



The border has an area of 96 cm².
Find the value of x.

5 Show that

$$\frac{x}{x+1} - \frac{x-1}{x} = \frac{1}{x(x+1)}$$

6 Prove that the sum of the squares of three consecutive integers is never a multiple of 3.

7 Show that

$$(2x + 1)^3 - (2x - 1)^3 = 2(12x^2 + 1)$$

8 (a) Show that

$$\frac{1}{x-1} - \frac{1}{x+1} = \frac{2}{x^2-1}$$

(b) Hence work out

$$\frac{1}{99} - \frac{1}{101}$$

Mr&Mrs MATHS

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Simplifying, expanding & factorising

1 $4x^3$

2 $(2x - 5)(2x + 5)$

3 $x^2 + 7x + 10 - (x^2 + 7x + 6)$

$= 4$

4 $(x + 6)(x + 4) - x(x - 2)$

$= x^2 + 10x + 24 - x^2 + 2x$

$= 12x + 24 = 96$

$x = 6$

5 $\dfrac{x^2 - (x - 1)(x + 1)}{x(x + 1)}$

$= \dfrac{x^2 - x^2 + 1}{x(x + 1)}$

$= \dfrac{1}{x(x + 1)}$

6 $(n - 1)^2 + n^2 + (n + 1)^2$

$= 3n^2 + 2$

Always 2 more than a multiple of 3, so never a multiple of 3.

7 $(2x + 1)^3 = 8x^3 + 12x^2 + 6x + 1$

$(2x - 1)^3 = 8x^3 - 12x^2 + 6x - 1$

Subtract: $24x^2 + 2$

$= 2(12x^2 + 1)$

8 (a) $\dfrac{(x + 1) - (x - 1)}{(x - 1)(x + 1)} = \dfrac{2}{x^2 - 1}$

(b) Use $x = 100$

$\dfrac{2}{9999}$

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