GCSE HIGHER · REVISION MAT 2

Simplifying, expanding & factorising

1 Expand and simplify

$$5(x + 3) + 2(3x - 4)$$

2 Factorise

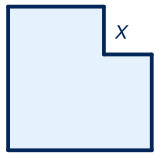
$$x^2 + 7x + 12$$

3 Sam says

$$(x + 3)^2 = x^2 + 9$$

Is Sam correct? Show working.

4 A square of side x cm is cut from the corner of a square of side $(2x + 1)$ cm.



Show the remaining area is $3x^2 + 4x + 1$ cm^2.

Factorise this fully.

5 Show that

$$(2x + 3)(x - 4) - (x - 2)(x - 6)$$

can be written as $x^2 + ax + b$.

Find the values of a and b.

6 $(ax + 3)(2x + b) \equiv 6x^2 + cx + 12$

Find the values of a, b and c.

7 Ali says

$$\frac{3}{x + 2} + \frac{2}{x - 1} = \frac{5}{2x + 1}$$

Show that Ali is wrong by writing the sum as a single fraction.

8 Prove that the sum of the squares of two consecutive odd numbers is 2 more than a multiple of 8.

Mr&Mrs MATHS

ANSWERS · REVISION MAT 2

Simplifying, expanding & factorising

1 $5x + 15 + 6x - 8$

$= 11x + 7$

2 **$(x + 3)(x + 4)$**

3 $(x+3)(x+3) = x^2 + 3x + 3x + 9$

$= x^2 + 6x + 9$, so Sam is wrong.

He has missed the $6x$ term.

4 $(2x + 1)^2 - x^2 = 4x^2 + 4x + 1 - x^2$

$= 3x^2 + 4x + 1$

$= (3x + 1)(x + 1)$

5 $2x^2 - 5x - 12 - (x^2 - 8x + 12)$

$= x^2 + 3x - 24$

$a = 3$, $b = -24$

6 x^2: $2a = 6 \Rightarrow a = 3$

Constant: $3b = 12 \Rightarrow b = 4$

x: $ab + 6 = 12 + 6$

$a = 3$, $b = 4$, $c = 18$

7 $\dfrac{3(x - 1) + 2(x + 2)}{(x + 2)(x - 1)}$

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

Ali added numerators and denominators separately.

8 $(2n + 1)^2 + (2n + 3)^2$

$= 8n^2 + 16n + 10$

$= 8(n^2 + 2n + 1) + 2$

2 more than a multiple of 8

Mr&Mrs MATHS