

# Simplifying an algebraic fraction by factorising - Higher

Maths

Mr Clasper



# Simplifying an algebraic fraction by factorising - Higher

1. Simplify each fraction.

a)  $\frac{(2y + 5)(y + 2)}{(2y + 5)(y + 3)}$

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

c)  $\frac{(3m - 3)}{(m + 5)(3m - 3)}$

d)  $\frac{(2w - 5)(3w + 2)}{(2w - 5)}$

2. Simplify each fraction.

a)  $\frac{2a^2 + 11a + 5}{(a + 3)(a + 5)}$

b)  $\frac{(b + 2)(b + 6)}{2b^2 + 7b + 6}$

c)  $\frac{2c^2 + 11c + 12}{2c^2 + 9c + 4}$

d)  $\frac{2d^2 + 11d + 5}{2d^2 - d - 1}$



# Simplifying an algebraic fraction by factorising - Higher

3. Each fraction has been simplified incorrectly. Find and correct each mistake.

$$\text{a) } \frac{2a^2 + 7a + 3}{2a^2 + 5a - 3} = \frac{(2a + 1)(a + 3)}{(2a - 1)(a + 3)} = \frac{(a + 3)}{(a + 3)}$$

$$\text{b) } \frac{(b + 3)}{2b^2 + 7b + 3} = \frac{(b + 3)}{(b + 3)(2b + 1)} = 2b + 1$$

$$\text{c) } \frac{4c^2 - 25}{2c^2 + c - 15} = \frac{(2c - 5)(2c - 5)}{(2c - 5)(c + 3)} = \frac{(2c - 5)}{(c + 3)}$$



# Answers



# Simplifying an algebraic fraction by factorising - Higher

1. Simplify each fraction.

$$\text{a) } \frac{(2y + 5)(y + 2)}{(2y + 5)(y + 3)} \quad \frac{(y + 2)}{(y + 3)}$$

$$\text{b) } \frac{(a + 5)(2a + 2)}{(2a + 3)(a + 5)} \quad \frac{(2a + 2)}{(2a + 3)}$$

$$\text{c) } \frac{(3m - 3)}{(m + 5)(3m - 3)} \quad \frac{1}{(m + 5)}$$

$$\text{d) } \frac{(2w - 5)(3w + 2)}{(2w - 5)} \quad 3w + 2$$

2. Simplify each fraction.

$$\text{a) } \frac{2a^2 + 11a + 5}{(a + 3)(a + 5)} \quad \frac{(2a + 1)}{(a + 3)}$$

$$\text{b) } \frac{(b + 2)(b + 6)}{2b^2 + 7b + 6} \quad \frac{(b + 6)}{(2b + 3)}$$

$$\text{c) } \frac{2c^2 + 11c + 12}{2c^2 + 9c + 4} \quad \frac{(2c + 3)}{(2c + 1)}$$

$$\text{d) } \frac{2d^2 + 11d + 5}{2d^2 - d - 1} \quad \frac{(d + 5)}{(d - 1)}$$



# Simplifying an algebraic fraction by factorising - Higher

3. Each fraction has been simplified incorrectly. Find and correct each mistake.

$$\text{a) } \frac{2a^2 + 7a + 3}{2a^2 + 5a - 3} = \frac{(2a + 1)(a + 3)}{(2a - 1)(a + 3)} = \frac{(a + 3)}{(a + 3)}$$

(2a + 1) and (2a - 1) are not equal therefore will not cancel.

(a + 3) and (a + 3) will cancel leaving  $\frac{(2a + 1)}{(2a - 1)}$

$$\text{b) } \frac{(b + 3)}{2b^2 + 7b + 3} = \frac{(b + 3)}{(b + 3)(2b + 1)} = 2b + 1$$

Should simplify to  $\frac{1}{2b + 1}$

$$\text{c) } \frac{4c^2 - 25}{2c^2 + c - 15} = \frac{(2c - 5)(2c - 5)}{(2c - 5)(c + 3)} = \frac{(2c - 5)}{(c + 3)}$$

Should factorise to (2c - 5)(2c + 5)

Should simplify to  $\frac{(2c + 5)}{(c + 3)}$

