Simplifying an algebraic fraction by factorising

Maths

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Simplifying an algebraic fraction by factorising

1. Simplify each fraction.

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

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

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

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

2. Simplify each fraction.

a) $\frac{a^2 + 5a + 6}{(a + 3)(a + 5)}$

b) $\frac{(b + 2)(b + 6)}{b^2 + 6b + 8}$

c) $\frac{c^2 + 7c + 12}{c^2 + 9c + 20}$

d) $\frac{d^2 - 9d - 10}{d^2 + 2d + 1}$

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

a) $\frac{a^2 + a - 6}{(a + 5)(a - 2)} = \frac{(a + 2)(a - 3)}{(a + 5)(a - 2)} = \frac{(a - 3)}{(a + 5)}$

b) $\frac{(b + 3)}{b^2 - 2b - 15} = \frac{(b + 3)}{(b - 5)(b + 3)} = b - 5$

c) $\frac{c^2 - 36}{c^2 - 3c - 18} = \frac{(c - 6)(c - 6)}{(c - 6)(c + 3)} = \frac{(c - 6)}{(c + 3)}$

Answers

Simplifying an algebraic fraction by factorising

1. Simplify each fraction.

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

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

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

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

2. Simplify each fraction.

a) $\frac{a^2 + 5a + 6}{(a + 3)(a + 5)}$ $\frac{(a + 2)}{(a + 5)}$

b) $\frac{(b + 2)(b + 6)}{b^2 + 6b + 8}$ $\frac{(b + 6)}{(b + 4)}$

c) $\frac{c^2 + 7c + 12}{c^2 + 9c + 20}$ $\frac{(c + 3)}{(c + 5)}$

d) $\frac{d^2 - 9d - 10}{d^2 + 2d + 1}$ $\frac{(d - 10)}{(d + 1)}$

Simplifying an algebraic fraction by factorising

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

a) $\frac{a^2 + a - 6}{(a + 5)(a - 2)} = \frac{(a + 2)(a - 3)}{(a + 5)(a - 2)} = \frac{(a - 3)}{(a + 5)}$

Should factorise to $(a - 2)(a + 3)$

The final answer should be $\frac{(a + 3)}{(a + 5)}$

b) $\frac{(b + 3)}{b^2 - 2b - 15} = \frac{(b + 3)}{(b - 5)(b + 3)} = b - 5$

Should simplify to $\frac{1}{b - 5}$

c) $\frac{c^2 - 36}{c^2 - 3c - 18} = \frac{(c - 6)(c - 6)}{(c - 6)(c + 3)} = \frac{(c - 6)}{(c + 3)}$

Should factorise to $(c - 6)(c + 6)$

Should simplify to $\frac{(c + 6)}{(c + 3)}$