

$$\frac{2x-3}{2} = \frac{2x}{2} \quad \frac{3}{2} = x - \frac{3}{2}$$

$$a, \quad \frac{3x+x^2}{12x} = \frac{1}{4} + \frac{x^2}{12x} = \frac{1}{4} + \frac{1}{12}x \Rightarrow \frac{x(3+x)}{12x} = \frac{3+x}{12}$$

$$b, \quad \frac{x^2-4x}{x-4} = \frac{x(x-4)}{1 \cdot (x-4)} = x$$

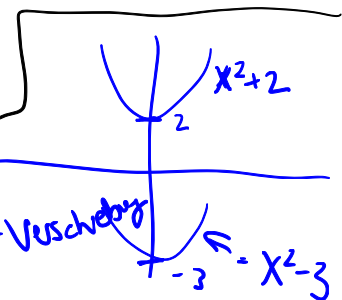
$$c, \quad \frac{2x}{4x^2} = \frac{2x}{x(4x)} = \frac{2x}{4 \cdot x \cdot x} = \frac{\cancel{2x}}{\cancel{2} \cdot \cancel{2} \cdot x \cdot x} = \frac{1}{2x}$$

$$d, \quad \frac{3x}{5} = \frac{3}{5}x = \frac{x}{5} \cdot 3 = \frac{1}{5} \cdot x \cdot 3$$

$$e, \quad \frac{x^2+2x+1}{x+1} = \frac{(x+1)(x+1)}{\cancel{x+1}} = x+1$$

$$(2x-3)^2 = (2x-3)(2x-3)$$

$$f, \quad \frac{4x^2-12x+9}{(2x-3)^2} = \frac{4x^2-12x+9}{(2x-3)^2} = \frac{2(2x-3)}{(2x-3)^2} = \frac{2}{2x-3}$$



$$\sqrt{4} = 2 \quad \sqrt{9} = 3$$

$$a^2x^2 + 2abx + b^2 = (ax+b)^2$$

1. Binomische Formel

$$a^2x^2 - 2abx + b^2 = (ax-b)^2$$

2. Binomische Formel

$$a^2x^2 - b^2 = (ax-b)(ax+b)$$

3. Binomische Formel

Beispiele

$$a, \quad 16x^2 - 25 = (4x-5)(4x+5)$$

$$b, \quad 9x^2 - 12x + 4 = (3x-2)^2$$

$$c, \quad 36x^2 - 48x + 16 = (6x-4)^2$$

2. Variante

Binomische Formel
erkennen

$$a) \frac{\cancel{4}}{\cancel{15}_3} \cdot \frac{\cancel{25}^5}{\cancel{8}_2} = \frac{5}{3 \cdot 2} = \frac{5}{6}$$

$$b) \frac{\cancel{2}^2 \cancel{6}}{\cancel{x}} \cdot \frac{\cancel{2x}}{\cancel{15}_5} = \frac{2}{x} \cdot \frac{2}{5} = \frac{4}{5x} = \frac{4}{5} \cdot \frac{1}{x} \neq \cancel{\frac{4}{5}x}$$

$$c) \frac{3}{4x^2} : \frac{9}{5x} = \frac{\cancel{3}}{4x^2} \cdot \frac{\cancel{5x}}{\cancel{9}_3} = \frac{1}{4x} \cdot \frac{5}{3} = \frac{5}{12x}$$

$$d) \frac{3}{4} + \frac{2}{5} = \frac{3 \cdot 5}{4 \cdot 5} + \frac{2 \cdot 4}{5 \cdot 4} = \frac{15}{20} + \frac{8}{20} = \frac{15+8}{20} = \frac{23}{20}$$

$$\textcircled{1} \quad \frac{\cancel{5x}}{\cancel{x^2} - \cancel{7x}} = \frac{5}{x-7} \quad \xrightarrow{\quad} \quad \frac{x(3x-6)}{5x-10} = \frac{3x(x-2)}{5(x-2)}$$

$$\textcircled{2} \quad \frac{3x^2 - 6x}{5x - 10} = \frac{3x(\cancel{x-2})}{5(\cancel{x-2})} = \frac{3}{5}x$$

$$\textcircled{3} \quad \frac{x-2}{x^2 - 2x} = \frac{\cancel{x-2}}{x(\cancel{x-2})} = \frac{1}{x}$$

$$\textcircled{4} \quad \frac{x^2 - 36}{x^2 + 12x + 36} = \frac{(x-6)(\cancel{x+6})}{(x+6)^2} = \frac{x-6}{x+6}$$

$$\textcircled{5} \quad \frac{3x^2 - 12x + 12}{5x^2 - 10x} = \frac{3(x^2 - 4x + 4)}{5x(x-2)} = \frac{3(\cancel{x-2})^2}{5x(\cancel{x-2})} = \frac{3(x-2)}{5x} = \frac{3x-6}{5x}$$

$$\textcircled{1} \quad \frac{\overset{4}{\cancel{8x}}}{\underset{3}{\cancel{3}} \cdot \underset{5}{\cancel{10x}}} \cdot \frac{\overset{7}{\cancel{21}}}{\underset{5}{\cancel{10x}}} = \frac{4 \cdot 7}{3 \cdot 5} = \frac{28}{15}$$

$$\textcircled{2} \quad \frac{2x+1}{10x} \cdot \frac{2x}{1+2x} = \frac{(\cancel{2x+1}) \cdot \cancel{2x}}{10x (\cancel{2x+1})} = \frac{2}{10} = \frac{1}{5}$$

$$\textcircled{3} \quad \frac{x+5}{x^2-4} : \frac{x^2-25}{x-2} = \frac{(x+5)(x-2)}{(x^2-4)(x^2-25)} = \frac{(\cancel{x+5})(\cancel{x-2})}{(\cancel{x-2})(x+2)(x-5)(\cancel{x+5})}$$

$$= \frac{1}{(x+2)(x-5)} = \frac{1}{x^2-5x+2x-10}$$

$$= \frac{1}{x^2-3x-10}$$

$$\textcircled{4} \quad \frac{8x^2-8x+2}{x^3} \cdot \frac{5x}{4x^2-1}$$

$$= \frac{2(4x^2-4x+1)}{x^3} \cdot \frac{5x}{(4x^2-1)} = \frac{2(\cancel{2x-1})^2 \cdot \cancel{5x}}{x^{\cancel{3}2} (\cancel{2x-1})(2x+1)} = \frac{2 \cdot 5 \cdot (2x-1)}{x^2(2x+1)}$$

$$= \frac{10(2x-1)}{2x^3+x^2} = \frac{20x-10}{2x^3+x^2}$$

$$\textcircled{5} \quad \frac{x+2}{5x} - \frac{x}{4} = \frac{x+2}{\textcircled{5x}} - \frac{5x}{\textcircled{5 \cdot 4}} = \frac{(\cancel{x+2}) \cdot \textcircled{4}}{\textcircled{4 \cdot 5x}} - \frac{5x \cdot x}{20x}$$

$$= \frac{(x+2) \cdot 4}{20x} - \frac{5x^2}{20x} = \frac{4x+8-5x^2}{20x}$$

Die letzten Aufgaben kommen von dieser Seite:

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