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Montag, 9. September 2019 17:26

5. Kürzen von Brüchen

$\frac{5}{10} = \frac{5 \cdot 1}{2 \cdot 5} = \frac{1}{2}$

a) $\frac{2a + 2ab}{2a^2 \cdot b} = \frac{2(a + ab)}{2(a^2 b)}$

$= \frac{2a(1 + b)}{2a(ab)} = \frac{1 + b}{ab} = \frac{1}{ab} + \frac{b}{ab}$

$= \frac{1}{ab} + \frac{1}{a}$

b) $\frac{24ab + 36ab^2}{12a^2 b} = \frac{12 \cdot 2ab + 12 \cdot 3ab^2}{12 \cdot a^2 b}$

$= \frac{2ab + 3ab^2}{a^2 b} = \frac{2 \cdot ab + 3 \cdot ab \cdot b}{ab \cdot a}$

$= \frac{2 + 3b}{a}$

c) $\frac{x^2 - 1^2}{(x+1)} = \frac{(x+1)(x-1)}{(x+1)} = x - 1$ (a · b; a; b)

$\frac{x^2 - 9}{x + 3} = \frac{(x+3) \cdot (x-3)}{(x+3)}$ (3^2)

d) $\frac{32ax^2 - 44a^2x + 96a^2x^2}{24a^2x^2}$

$= \frac{4 \cdot 8 \cdot a \cdot x \cdot x - 4 \cdot 11 \cdot a \cdot a \cdot x + 4 \cdot 24 \cdot a \cdot a \cdot x \cdot x}{4 \cdot 6 \cdot a \cdot a \cdot x \cdot x}$

$= \frac{8x - 11a + 24ax}{6ax}$

$= \frac{4 \cdot 8x}{3 \cdot 6ax} - \frac{11a}{6ax} + \frac{4 \cdot 24ax}{6ax} = \frac{4}{3a} - \frac{11}{6x} + 4$

6. Addition von Brüchen

a) $\frac{7a - 3b}{2} + \frac{12a - 2b}{3} = \frac{3 \cdot (7a - 3b)}{3 \cdot 2} + \frac{2 \cdot (12a - 2b)}{2 \cdot 3}$

a) $\frac{7a-3b}{2} + \frac{12a-2b}{3} = \frac{3\cdot(7a-3b)}{3\cdot 2} + \frac{2\cdot(12a-2b)}{2\cdot 3}$

$= \frac{21a-9b+24a-4b}{6} = \frac{45a-13b}{6}$

$\frac{7a}{2} - \frac{3b}{2} + \frac{12a}{3} - \frac{2b}{3} = \frac{7a}{2} + \frac{12a}{3} - \frac{3b}{2} - \frac{2b}{3}$

$= \frac{3\cdot 7a}{3\cdot 2} + \frac{2\cdot 12a}{2\cdot 3} - \frac{3\cdot 3b}{3\cdot 2} - \frac{2\cdot 2b}{2\cdot 3}$

$= \frac{21a}{6} + \frac{24a}{6} - \frac{9b}{6} - \frac{4b}{6}$

$= \frac{45a}{6} + \left(-\frac{9b}{6}\right) + \left(-\frac{4b}{6}\right) = \frac{45a}{6} - \frac{13b}{6} = \frac{45a-13b}{6}$

b) $\frac{1}{(x+1)} + \frac{2}{(x+2)} = \frac{(x+2)\cdot 1}{(x+1)(x+2)} + \frac{(x+1)\cdot 2}{(x+1)(x+2)}$

$\frac{x+2+2x+2}{(x+1)(x+2)} = \frac{3x+4}{x^2+3x+2}$ | $\frac{3x+4}{(x+1)(x+2)}$

c) $\frac{4a^2-3b}{a^2b} - \frac{2a+3b}{b^2}$