Selbsttest – Bruchterme

1. Bestimme die Definitionsmenge:

a) $\frac{1999}{6x+9+x^2}$ $= (x+3)^2$ $\mathbb{D} = \mathbb{R} \setminus \{-3\}$

b) $\frac{x^2}{3x-4x^2}$ $= x(3-4x)$ $\mathbb{D} = \mathbb{R} \setminus \{0, \frac{3}{4}\}$

2. Kürze so weit wie möglich:

a) $\frac{ax+bx}{cx} = \frac{x(a+b)}{cx} = \frac{a+b}{c}$

b) $\frac{abc}{4abcd} = \frac{1}{4d}$

c) $\frac{64-25a^2}{64-80a+25a^2} = \frac{(8-5a)(8+5a)}{(8-5a)^2} = \frac{8+5a}{8-5a}$

d) $\frac{ax-bx+ay-by}{5a-5b} = \frac{(x+y)(a-b)}{5(a-b)} = \frac{x+y}{5}$

3. Berechne/ Vereinfache/ Kürze:

a) $\frac{(a+b)^2}{2ab} - \frac{(a-b)^2}{2ab} = \frac{a^2+2ab+b^2-(a^2-2ab+b^2)}{2ab} = \frac{4ab}{2ab} = 2$

b) $1 + \frac{a}{b} = \frac{b+a}{b}$

c) $\frac{(x-y)^2}{x+y} + (x+y) = \frac{(x-y)^2+(x+y)^2}{x+y} = \frac{2x^2+2y^2}{x+y}$

d) $\frac{3q+4p}{3q-4p} + \frac{3q-4p}{3q+4p} - \frac{48pq}{9q^2-16p^2} = \frac{(3q+4p)(3q+4p)+(3q-4p)(3q-4p)-48pq}{(3q-4p)(3q+4p)}$

$= \frac{9q^2+24pq+16p^2+9q^2-24pq+16p^2-48pq}{(3q-4p)(3q+4p)}$

$= \frac{18q^2+32p^2-48pq}{(3q-4p)(3q+4p)} = \frac{2(3q-4p)}{3q+4p}$