

Vereinfache die angegebenen Terme, gib an welche Werte die Variablen nicht annehmen dürfen und führe eine geeignete Probe durch!

1. (a) $\left(\frac{a^2}{2b^2} - \frac{3a}{2b} + \frac{3}{2} - \frac{b}{2a}\right) \cdot 2b =$

(b) $\left(\frac{9}{2xy} - \frac{3}{x^2} + \frac{y}{2x^3}\right) \cdot 4x^2y^2 =$

2. (a) $\left(\frac{x^2+y^2}{6xy} - \frac{1}{3}\right) \cdot 3x =$

(b) $\left(\frac{a^2-b^2}{4a^2b} - \frac{a-b}{2a^2}\right) \cdot 2a =$

3. (a) $\left(\frac{a}{a+b} + \frac{b}{a-b}\right) \cdot (a^2 - b^2) =$

(b) $\left(\frac{x+y}{x-y} - \frac{x-y}{x+y}\right) \cdot (x^2 - y^2) =$

4. (a) $\frac{u^3+v^3}{uv-v^2} \cdot \frac{u-v}{u^2+uv} + 1 =$

(b) $\left(\frac{3}{z-5} - \frac{3}{z+5} - \frac{29}{z^2-25}\right) \cdot (z^2 - 25) =$

5. (a) $\frac{p+q}{q} \left(\frac{p}{p+q} - \frac{p-q}{p}\right) =$

(b) $\frac{u^3-v^3}{u} \cdot \frac{v+u}{u^2v-v^3} - 1 =$

6. (a) $\left(\frac{b}{a} - \frac{2b}{2a+b}\right) \cdot \frac{4a^3-ab^2}{2b^2} =$

(b) $\left(1 - \frac{2xy}{x^2+y^2}\right) \cdot \left(\frac{x^2+y^2}{2xy} + 1\right) \cdot \left(\frac{x^2-y^2}{2xy} + \frac{2xy}{x^2-y^2}\right) =$

7. (a) $\left(\frac{1}{p+q} + \frac{1}{p-q}\right) \cdot \left(\frac{p}{q} - \frac{q}{p}\right) =$

(b) $\frac{a-c}{2(a-b)} - \frac{a-b}{2} \left(\frac{2b}{a^2-b^2} - \frac{a+c}{(a-b)^2}\right) =$

8. (a) $\left(\frac{1}{2x-3y} - \frac{1}{2x}\right) \cdot \frac{8x^3-18xy^2}{3y^2} =$

(b) $\left(\frac{p+q}{q} - \frac{4p}{p+q}\right) \cdot \left(\frac{p-q}{p} + \frac{4q}{p-q}\right) =$

9. (a) $\left(\frac{1}{3a-2b} - \frac{1}{3a}\right) \cdot \frac{27a^3-12ab^2}{4b^2} =$

(b) $\left(\frac{1}{x-y} - \frac{1}{x+y}\right) \cdot \left(\frac{4x^2+8xy+4y^2}{8y}\right) =$

10. (a) $\left(\frac{2}{3a-b} - \frac{1}{2a}\right) : \frac{a+b}{6a-2b} =$

(b) $\left(\frac{y}{x-2y} - \frac{y}{x}\right) : \frac{4y^2}{x^3-4xy^2} =$

11. (a) $\left(\frac{1}{2a-3b} - \frac{1}{2a}\right) : \frac{3}{4a-6b} =$

(b) $\left(\frac{y}{x} - \frac{2y}{2x+y}\right) : \frac{2y^2}{4x^3-xy^2} =$

12. (a) $\left(\frac{p^3}{8} + \frac{q^3}{27}\right) : \left(\frac{p}{2} + \frac{q}{3}\right) =$

(b) $\left(\frac{8a^3}{27} - b^3\right) : \left(\frac{2a}{3} - b\right) =$

13. (a) $\left(6x^2 + \frac{5xy}{4} - \frac{3y^2}{8}\right) : \left(3x - \frac{y}{2}\right) =$

(b) $\left(\frac{a^2}{2} - \frac{145ab}{144} + \frac{b^2}{2}\right) : \left(\frac{2a}{3} - \frac{3b}{4}\right) =$

14. (a) $\frac{ab}{a-b} \left(\frac{1}{a} + \frac{1}{b}\right) + \frac{ab}{a+b} \left(\frac{1}{a} - \frac{1}{b}\right) =$

(b) $1 - \frac{p+q}{p-q} \left(\frac{p-q}{p+q} - \frac{p-q}{p} + \frac{p}{p+q}\right) =$

15. (a) $\frac{a-b}{ab} \left(\frac{1}{a} + \frac{1}{b}\right) + \frac{a+b}{ab} \left(\frac{1}{a} - \frac{1}{b}\right) =$

(b) $\left(\frac{p}{q} + \frac{q}{p}\right)^2 - \left(\frac{p}{q} - \frac{q}{p}\right)^2 =$

16. (a) $\frac{x+\frac{1}{y}}{x-\frac{1}{y}} =$

(b) $\frac{\frac{a}{b} + \frac{b}{a}}{\frac{a}{b} - \frac{b}{a}} =$

(c) $\frac{1+\frac{x}{y}}{1-\frac{x}{y}} =$

17. (a) $\frac{1+\frac{1}{z}}{1-\frac{1}{z}} =$

(b) $\frac{\frac{x}{y}}{1-\frac{x}{y}} =$

(c) $\frac{1}{1+\frac{x}{y}} =$

18. (a) $\frac{\left(\frac{a}{b} - \frac{b}{a}\right)}{\frac{2}{a} - \frac{2}{b}} =$

(b) $\frac{\left(\frac{x}{y} + \frac{y}{x}\right)}{\left(\frac{x}{z} - \frac{y}{z}\right)} =$

(c) $\frac{z}{2} \cdot \frac{\frac{z-2}{z+2}-1}{\frac{z+2}{z-2}+1} =$

19. (a) $\left(\frac{\frac{z-1}{z}}{\frac{z^2-1}{4z^2}}\right) \cdot \frac{1+z}{1-z} =$

(b) $\frac{\frac{x+2y}{3x}}{\frac{x^2-4y^2}{x^2}-\frac{1}{3}} =$

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