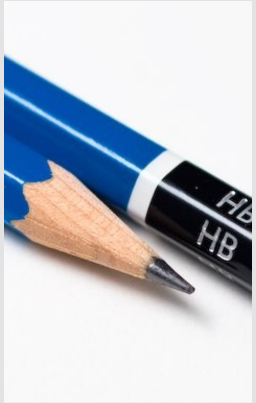


Man vereinfache so weit wie möglich

a) $\dfrac{1}{a} + \dfrac{2}{b} + \dfrac{1}{c}$

b) $\dfrac{1}{a\,b} + \dfrac{1}{a\,c} + \dfrac{1}{b\,c}$

c) $\dfrac{b - 4\,a}{a + b} + \dfrac{2\,a^2 + 5\,a\,b + 3\,b^2}{(a + b)^2} - 1$

d) $\dfrac{a}{b^2\,c} + \dfrac{c}{a\,b^2} - \dfrac{2}{b^2}$

e) $\dfrac{3}{a - 1} + \dfrac{6}{1 - a^2} - \dfrac{5}{a + 1}$

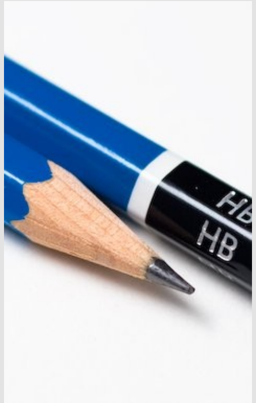
a) $$\frac{1}{a} + \frac{2}{b} + \frac{1}{c} = \frac{b\,c + 2\,a\,c + ab}{a\,b\,c}$$

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

c) $$\frac{b - 4\,a}{a + b} + \frac{2\,a^2 + 5\,a\,b + 3\,b^2}{(a + b)^2} - 1 = -\frac{3\,(a - b)}{a + b}$$

d) $$\frac{a}{b^2\,c} + \frac{c}{a\,b^2} - \frac{2}{b^2} = \frac{(a - c)^2}{a\,b^2\,c}$$

e) $$\frac{3}{a - 1} + \frac{6}{1 - a^2} - \frac{5}{a + 1} = -\frac{2}{a + 1}$$



Man vereinfache so weit wie möglich

a) $\dfrac{a}{x^2 - a^2} - \dfrac{x + a}{x - a} + \dfrac{x - a}{x + a}$

b) $\dfrac{a}{x^2 - a^2} - \dfrac{2x}{x - a} - \dfrac{a - x}{x + a}$

c) $\dfrac{1}{x} - \dfrac{1}{y} + \dfrac{x - y}{x y} - \dfrac{(x + y)^2}{x y}$

d) $\dfrac{1 + x}{1 - x} - \dfrac{1 - x}{1 + x} + \dfrac{2x}{1 - x^2}$

e) $\dfrac{4x + 1}{x - 1} - \dfrac{3x - 2}{x + 2} - \dfrac{x(x + 14)}{(x - 1)(x + 2)}$

f) $\dfrac{9x + 5}{x^2 - 1} - \dfrac{7x + 4}{x^2 - x} - \dfrac{2(x - 2)}{x^2 + x} + 1$

$$a)\quad \frac{a}{x^2 - a^2} - \frac{x + a}{x - a} + \frac{x - a}{x + a} = \frac{a(4x - 1)}{(x + a)(x - a)}$$

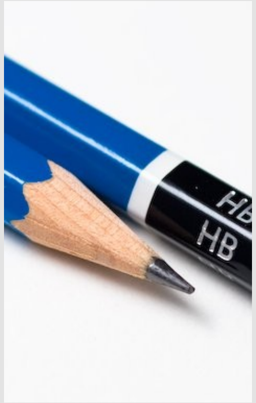
$$b)\quad \frac{a}{x^2 - a^2} - \frac{2x}{x - a} - \frac{a - x}{x + a} = \frac{a + a^2 - 4ax - x^2}{(x + a)(x - a)}$$

$$c)\quad \frac{1}{x} - \frac{1}{y} + \frac{x - y}{xy} - \frac{(x + y)^2}{xy} = -\frac{(x + y)^2}{xy}$$

$$d)\quad \frac{1 + x}{1 - x} - \frac{1 - x}{1 + x} + \frac{2x}{1 - x^2} = \frac{6x}{1 - x^2}$$

$$e)\quad \frac{4x + 1}{x - 1} - \frac{3x - 2}{x + 2} - \frac{x(x + 14)}{(x - 1)(x + 2)} = 0$$

$$f)\quad \frac{9x + 5}{x^2 - 1} - \frac{7x + 4}{x^2 - x} - \frac{2(x - 2)}{x^2 + x} + 1 = \frac{x^3 - x - 8}{x^3 - x}$$



In den Nennern der folgenden Brüche sind die Wurzeln zu beseitigen:

Beispiel:

$$\frac{1-\sqrt{2}}{1+\sqrt{2}} = \frac{(1-\sqrt{2})^2}{(1+\sqrt{2})\,(1-\sqrt{2})} = \frac{1-2\sqrt{2}+(\sqrt{2})^2}{1-(\sqrt{2})^2} =$$

$$= \frac{3-2\sqrt{2}}{-1} = 2\sqrt{2}-3$$

a) $\dfrac{2+\sqrt{2}}{\sqrt{2}}$

b) $\dfrac{a+b}{\sqrt{a}-\sqrt{b}} \qquad (a\,,\ b \geqslant 0, \quad a \neq b)$

c) $\dfrac{1+\sqrt{3}}{2\sqrt{3}+3\sqrt{2}}$, d) $\dfrac{1+\sqrt{2}-\sqrt{3}}{1-\sqrt{2}+\sqrt{6}}$

e) $\dfrac{\sqrt{3}-\sqrt{2}}{\sqrt{2}+\sqrt{3}-\sqrt{8}}$

$$a)\quad \frac{2+\sqrt{2}}{\sqrt{2}} = \frac{(2+\sqrt{2})\sqrt{2}}{2} = 1+\sqrt{2}$$

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

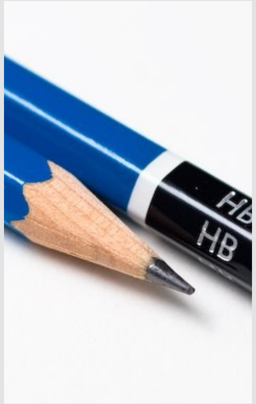
$$c)\quad \frac{1+\sqrt{3}}{2\sqrt{3}+3\sqrt{2}} = \frac{(1+\sqrt{3})(2\sqrt{3}-3\sqrt{2})}{(2\sqrt{3}+3\sqrt{2})(2\sqrt{3}-3\sqrt{2})} =$$

$$= -1+\frac{\sqrt{2}}{2}-\frac{\sqrt{3}}{3}+\frac{\sqrt{6}}{2}$$

$$d)\quad \frac{1+\sqrt{2}-\sqrt{3}}{1-\sqrt{2}+\sqrt{6}} = 15-11\sqrt{2}+9\sqrt{3}-6\sqrt{6}$$

Hinweis: $$\frac{1+\sqrt{2}-\sqrt{3}}{1-\sqrt{2}+\sqrt{6}} = \frac{(1+\sqrt{2}-\sqrt{3})\,(1-\sqrt{2}-\sqrt{6})}{(1-\sqrt{2})^2-6}$$

$$e)\quad \frac{\sqrt{3}-\sqrt{2}}{\sqrt{2}+\sqrt{3}-\sqrt{8}} = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{2}+\sqrt{3}-2\sqrt{2}} = 1$$



In den Nennern der folgenden Brüche sind die Wurzeln zu beseitigen:

$$a)\quad \frac{2\sqrt{3}}{\sqrt{2}+\sqrt{3}+\sqrt{5}}$$

$$b)\quad \frac{1}{2+\sqrt{2}+\sqrt{3}+\sqrt{6}}$$

$$a)\quad \frac{2\sqrt{3}}{\sqrt{2}+\sqrt{3}+\sqrt{5}} = \frac{2\sqrt{3}\,(\sqrt{2}+\sqrt{3}-\sqrt{5})}{(\sqrt{2}+\sqrt{3}+\sqrt{5})\,(\sqrt{2}+\sqrt{3}-\sqrt{5})} =$$

$$= \frac{2\sqrt{3}\,(\sqrt{2}+\sqrt{3}-\sqrt{5})}{(\sqrt{2}+\sqrt{3})^2-(\sqrt{5})^2} = \frac{2\sqrt{3}\,(\sqrt{2}+\sqrt{3}-\sqrt{5})}{(\sqrt{2})^2+2\sqrt{2}\cdot\sqrt{3}+(\sqrt{3})^2-(\sqrt{5})^2} =$$

$$= \frac{1}{\sqrt{2}}\,(\sqrt{2}+\sqrt{3}-\sqrt{5}) = \frac{1}{2}\,(2+\sqrt{6}-\sqrt{10})$$

$$b)\quad \frac{1}{2+\sqrt{2}+\sqrt{3}+\sqrt{6}} = \frac{2+\sqrt{2}-(\sqrt{3}+\sqrt{6})}{(2+\sqrt{2}+\sqrt{3}+\sqrt{6})\,(2+\sqrt{2}-(\sqrt{3}+\sqrt{6}))} =$$

$$= \sqrt{6}+\sqrt{2}-\sqrt{3}-2$$