

DIE AUFGABEN

Lösen Sie diese Aufgaben unter Verwendung des Distributivgesetzes: $a(b + c - e) = ab + ac - ae$

$$1 \quad xy\left(\frac{x}{y} - \frac{y}{x}\right) =$$

$$2 \quad \left(c - \frac{d}{c}\right)\left(c + \frac{d}{c}\right) =$$

$$3 \quad \left(\frac{n}{2} - \frac{1}{n}\right)^2 =$$

$$4 \quad -\frac{r^2}{s^2}\left(\frac{s}{r} - \frac{s^2}{r^2} + \frac{s^3}{r^3}\right) =$$

$$5 \quad (u - z)\left(\frac{u}{u - z} - \frac{z}{u^2 - z^2}\right) =$$

$$6 \quad \left(\frac{p}{q} - 1\right)^2 - \left(\frac{p}{q} + 1\right)^2 =$$

$$7 \quad \frac{u^2 - v^2}{u^2 + v^2}\left(\frac{u}{u + v} + \frac{v}{u - v}\right) =$$

$$8 \quad \left(\frac{x}{3} - \frac{y}{2}\right)\left(\frac{x}{2} + y\right) - \left(\frac{x}{3} + y\right)\left(\frac{x}{2} - y\right) =$$

DIE LÖSUNGEN

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

$$2 \quad \left(c - \frac{d}{c} \right) \left(c + \frac{d}{c} \right) = c^2 - \left(\frac{d}{c} \right)^2 = c^2 - \frac{d^2}{c^2}$$

Binomische Formel!

$$3 \quad \left(\frac{n}{2} - \frac{1}{n} \right)^2 = \frac{n^2}{4} - 2 \cdot \frac{n}{2} \cdot \frac{1}{n} + \frac{1}{n^2} = \frac{n^2}{4} - 1 + \frac{1}{n^2}$$

Binomische Formel!

$$4 \quad -\frac{r^2}{s^2} \left(\frac{s}{r} - \frac{s^2}{r^2} + \frac{s^3}{r^3} \right) = -\frac{r^2 s}{s^2 r} + \frac{r^2 s^2}{s^2 r^2} - \frac{r^2 s^3}{s^2 r^3} = -\frac{r}{s} + 1 - \frac{s}{r}$$

$$5 \quad (u-z) \left(\frac{u}{u-z} - \frac{z}{u^2-z^2} \right) = \frac{(u-z)u}{u-z} - \frac{(u-z)z}{(u+z)(u-z)} = u - \frac{z}{u+z}$$

$$6 \quad \left(\frac{p}{q} - 1 \right)^2 - \left(\frac{p}{q} + 1 \right)^2 = \left(\frac{p^2}{q^2} - \frac{2p}{q} + 1 \right) - \left(\frac{p^2}{q^2} + \frac{2p}{q} + 1 \right) = -\frac{4p}{q}$$

$$7 \quad \frac{u^2 - v^2}{u^2 + v^2} \left(\frac{u}{u+v} + \frac{v}{u-v} \right) = \frac{(u+v)(u-v)u}{(u^2+v^2)(u+v)} + \frac{(u+v)(u-v)v}{(u^2+v^2)(u-v)} = \frac{(u-v)u}{u^2+v^2} + \frac{(u+v)v}{u^2+v^2} \\ = \frac{u^2 - uv + uv + v^2}{u^2+v^2} = \frac{u^2+v^2}{u^2+v^2} = 1$$

$$8 \quad \left(\frac{x}{3} - \frac{y}{2} \right) \left(\frac{x}{2} + y \right) - \left(\frac{x}{3} + y \right) \left(\frac{x}{2} - y \right) = \left(\frac{x^2}{6} + \frac{xy}{3} - \frac{xy}{4} - \frac{y^2}{2} \right) - \left(\frac{x^2}{6} - \frac{xy}{3} + \frac{xy}{2} - y^2 \right) \\ = \frac{x^2}{6} + \frac{xy}{3} - \frac{xy}{4} - \frac{y^2}{2} - \frac{x^2}{6} + \frac{xy}{3} - \frac{xy}{2} + y^2 \\ = \frac{y^2}{2} - \frac{xy}{12}$$