Vereenvoudig, sonder 'n sakrekenaar: (Skryf antwoorde as positiewe eksponente!)

(1) $(0{,}125)^{-2} + (0{,}5)^{-1}$

$= \left(\frac{1}{8}\right)^{-2} + \left(\frac{1}{2}\right)^{-1}$

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

$= (2^{-3})^{-2} + (2^{-1})^{-1}$

$= 2^6 + 2^1 = 64 + 2$

$= 66$

(2) $(2x^2 + 2x^{-2})^2 + (2x^2 \times 2x^{-2})^2$

$= (2x^2 + 2x^{-2})(2x^2 + 2x^{-2}) + (4x^{2-2})^2$

$= 4x^4 + 8x^{2-2} + 4x^{-4} + (4x^0)^2$

$= 4x^4 + 8x^0 + 4x^{-4} + (4 \times 1)^2$

$= 4x^4 + 8(1) + 4 \times \frac{1}{x^4} + (4)^2$

$= 4x^4 + 8 + \frac{4}{x^4} + 16$

$= 4x^4 + 24 + \frac{4}{x^4}$

(3) $\sqrt[3]{-8x^9y^{-3}}$

$= \sqrt[3]{-8} \times \sqrt[3]{x^9} \times \sqrt[3]{y^{-3}}$

$= -2 \times x^{\frac{9}{3}} \times y^{\frac{-3}{3}}$

$= -2 \times x^3 \times y^{-1}$

$= \frac{-2x^3}{y^1}$

$= \frac{-2x^3}{y}$

(4) $3y^{\frac{1}{2}} \div (3y)^{\frac{-1}{2}}$

$= 3^1 y^{\frac{1}{2}} \div \left(3^{\frac{-1}{2}} \times y^{\frac{-1}{2}}\right)$

$= 3^{1-\left(\frac{-1}{2}\right)} \times y^{\frac{1}{2}-\left(\frac{-1}{2}\right)}$

$= 3^{1+\frac{1}{2}} \times y^{\frac{1}{2}+\frac{1}{2}}$

$= 3^{1\frac{1}{2}} y^1$

$= 3^{1\frac{1}{2}} y$

(5) $$\frac{m^{-2}-3}{m^{-3}-3m^{-1}} = \frac{(m^{-2}-3)}{m^{-1}(m^{-2}-3)}$$

$$= \frac{\cancel{(m^{-2}-3)}}{m^{-1}\cancel{(m^{-2}-3)}}$$

$$= \frac{1}{m^{-1}}$$

$$= m^1 = m$$

(6) $$\frac{\left(9x^{\frac{2}{3}}y^{-4}\right)^{\frac{-3}{2}}}{3xy} = \frac{\left(3^2x^{\frac{2}{3}}y^{-4}\right)^{\frac{-3}{2}}}{3x^1y^1}$$

$$= \frac{3^{2\times\frac{-3}{2}}\, x^{\frac{2}{3}\times\frac{-3}{2}}\, y^{-4\times\frac{-3}{2}}}{3x^1y^1}$$

$$= \frac{3^{-3}\, x^{-1}\, y^{6}}{3^1x^1y^1} = 3^{-3-1}\, x^{-1-1}\, y^{6-1}$$

$$= \frac{y^5}{3^4x^2}$$

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

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

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

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

(8) $$\frac{2^{2n}-3.2^n+2}{2^n-2} = \frac{(2^n)^2-3.2^n+2}{2^n-2}$$

$$= \frac{\cancel{(2^n-2)}(2^n-1)}{\cancel{(2^n-2)}}$$

$$= 2^n - 1$$

(9) $\sqrt[3]{(0{,}125)^{-2}} + (125^2)^{\frac{1}{3}}$

$$= \sqrt[3]{\left(\frac{1}{8}\right)^{-2}} + ((5^3)^2)^{\frac{1}{3}}$$

$$= \sqrt[3]{\left(\frac{1}{2^3}\right)^{-2}} + (5^6)^{\frac{1}{3}}$$

$$= \sqrt[3]{(2^{-3})^{-2}} + 5^2$$

$$= \sqrt[3]{2^6} + 5^2$$

$$= \sqrt[3]{2^6} + 5^2$$

$$= 2^{\frac{6}{3}} + 25$$

$$= 2^2 + 25$$

$$= 4 + 25$$

$$= 29$$

(10) $\dfrac{12^{n+1} \cdot 9^{n-2}}{18^{2n-1} \cdot 3^{-n}}$

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

$$= \frac{2^{2n+2} . 3^{n+1} . 3^{2n-4}}{3^{4n-2} . 2^{2n-1} . 3^{-n}}$$

$$= \frac{2^{2n+2} . 3^{n+1+2n-4}}{3^{4n-2-n} . 2^{2n-1}}$$

$$= \frac{2^{2n+2} . 3^{3n-3}}{3^{3n-2} . 2^{2n-1}}$$

$$= 2^{2n+2-(2n-1)} . 3^{3n-3-(3n-2)}$$

$$= 2^{2n+2-2n+1} . 3^{3n-3-3n+2}$$

$$= 2^3 . 3^{-1}$$

$$= 8 . \frac{1}{3}$$

$$= \frac{8}{3} = 2\frac{2}{3}$$