1. a) $350000000\ \text{kg} = 3{,}5 \cdot 10^8\ \text{kg}$

b) $0{,}000054\ \text{m} = 5{,}4 \cdot 10^{-5}\ \text{m}$

c) $2340000000000\ \text{s} = 2{,}34 \cdot 10^{12}\ \text{s}$

b) $0{,}000000000225\ \text{m} = 2{,}25 \cdot 10^{-10}\ \text{cm}$

2. a) $(-2)^{-3} = \dfrac{1}{(-2)^3} = \dfrac{1}{-8} = -\dfrac{1}{8}$

b) $-2 \cdot 3^4 : (-2)^3 = -2 \cdot 81 : (-8) = \dfrac{-162}{-8} = \dfrac{81}{4} = 20{,}25$

c) $\left(\dfrac{1}{2}\right)^{-3} + \left(\dfrac{1}{5}\right)^0 - \left(-\dfrac{2}{5}\right)^{-2} = 2^3 + 1 - \left(-\dfrac{5}{2}\right)^2 = 9 - 6{,}25 = 2{,}75$

d) $(x^4)^{-3} \cdot (x^3 \cdot x^5)^2 = x^{-12} \cdot (x^8)^2 = x^{-12} \cdot x^{16} = x^4$

e) $(2x)^3 \cdot x^{-2} : (5x)^{-1} = 8x^3 \cdot x^{-2} : \dfrac{1}{5x} = 8x \cdot 5x = 40x^2$

f) $\dfrac{x^4 \cdot y^{-1}}{x^{-2} \cdot y} \cdot \dfrac{3y^3}{(x^2)^3} = x^6 \cdot y^{-2} \cdot \dfrac{3y^3}{x^6} = 3y$

4. a) $\dfrac{1}{2x} + \dfrac{x+2}{x^2} = \dfrac{5}{6x} \;\Big|\cdot 6x^2 \quad \Rightarrow \quad 3x + (x+2)\cdot 6 = 5x \quad \Leftrightarrow \quad x = -3$

b) $\dfrac{1}{2x} - \dfrac{x-2}{x^2+2x} = \dfrac{3}{4+2x}$

$\dfrac{1}{2x} - \dfrac{x-2}{x\cdot(x+2)} = \dfrac{3}{2\cdot(2+x)} \;\Big|\cdot 2x\cdot(x+2) \quad \Rightarrow \quad (x+2) - (x-2)\cdot 2 = 3x \quad \Leftrightarrow \quad x = \dfrac{3}{2}$

5. a) $\dfrac{1}{a} - \dfrac{2}{b} = \dfrac{3}{c} \;\Big|\cdot abc \quad \Rightarrow \quad bc - 2ac = 3ab \quad \Leftrightarrow \quad bc = 3ab + 2ac \quad \Leftrightarrow$

$bc = a\cdot(3b+2c) \quad \Rightarrow \quad \dfrac{bc}{3b+2c} = a$

Analog Auflösung nach b und c.

b) $\frac{4d}{a+2c} = \frac{3}{b} \;\Big|\; \cdot b\cdot(a+2c) \quad \Rightarrow \quad 4bd = 3a+6c \quad \Leftrightarrow \quad 4bd-6c = 3a$

$$\Rightarrow \quad \frac{4bd-6c}{3} = a$$

Analog Auflösung nach b und c.