

$$6.15 a) 5xy(2x^5y)^3 = 5xy \cdot 2^3 (x^5)^3 y^3 = 5xy \cdot 8 x^{15} y^3 = 40 x^{1+15} y^{1+3} = 40 x^{16} y^4$$

$$b) \frac{(-x^3y)^7}{x^2 \cdot (y^3)^2} = \frac{-(x^3)^7 \cdot y^7}{x^2 \cdot y^6} = - \frac{x^{21}}{x^2} \cdot \frac{y^7}{y^6} = -x^{19}y$$

$$6.23 \quad \frac{4^{3m+2} \cdot 2 \cdot 8^{2m-1}}{16^{3m}} = \frac{(2^2)^{3m+2} \cdot 2 \cdot (2^3)^{2m-1}}{(2^4)^{3m}} = \frac{2^{2(3m+2)} \cdot 2^1 \cdot 2^{3(2m-1)}}{2^{4 \cdot 3m}} = \frac{2^{2(3m+2)+1+3(2m-1)}}{2^{12m}} = \frac{2^{6m+4+1+6m-3-12m}}{2^{12m}} = \frac{2^{2}}{1} = 4 \text{ einig m:sto}$$

$$\text{Exim. 1 a) } 2^{1001} \cdot 5^{1002} \cdot 0,1^{1000} = 2 \cdot 2^{1000} \cdot 5^2 \cdot 5^{1000} \cdot 0,1^{1000} = 2 \cdot 5^2 \cdot 2^{1000} \cdot 5^{1000} \cdot 0,1^{1000} = 2 \cdot 25 \cdot (2 \cdot 5 \cdot 0,1)^{1000} = 50 \cdot 1^{1000} = 50 \cdot 1 = 50$$

$$b) 8^{2002} \cdot 0,5^{6000} = (2^3)^{2002} \cdot 0,5^{6000} = 2^{6006} \cdot 0,5^{6000} = 2^6 \cdot 2^{6000} \cdot 0,5^{6000} = 2^6 \cdot (2 \cdot 0,5)^{6000} = 64 \cdot 1^{6000} = 64 \cdot 1 = 64$$

$$c) \frac{25^{801}}{5^{1599}} = \frac{(5^2)^{801}}{5^{1599}} = \frac{5^{1602}}{5^{1599}} = 5^{1602-1599} = 5^3 = 125$$

Exim. 2 Siehe unten

$$a) x^m x^m = x^{m+m} = x^{2m}$$

$$\text{TA: } x^m x^m = (xx)^m = (x^2)^m = x^{2m}$$

$$b) \frac{x^{2m+1}}{x^m x^m} = \frac{x^{2m+1}}{x^{2m}} = x^{2m+1-2m} = x^1 = x$$

$$c) \frac{x^m x^m}{x^m + x^m} = \frac{x^{2m}}{2 \cdot x^m} = \frac{1}{2} \cdot \frac{x^{2m}}{x^m} = \frac{1}{2} x^{2m-m} = \frac{1}{2} x^m (= \frac{x^m}{2})$$