

Matematik B Fredag 28/8 2015

- Fremmødereregistrering.
- Meddelelser. Spørgsmål?
- Grupper: Træning i beviser:
 - Løsningsformel for andengradsligning.
- Nyt stof:
Mere om potenser og rødder.
AB1 side 59-66. MF (10)-(18).
- Nye opgaver:
Øvelse 9.7, 9.11 & 9.12.
Opgaver 61, 62, 64, 65, 66 og 67.
 - løsninger på BB>Opgaver

HUSK også side 42-47

Potensregneregler

fra MFS

$$(10) \quad a^r \cdot a^s = a^{r+s}$$

$$(11) \quad \frac{a^r}{a^s} = a^{r-s}$$

$$(12) \quad (a^r)^s = a^{r \cdot s}$$

$$(13) \quad (a \cdot b)^r = a^r \cdot b^r$$

$$(14) \quad \left(\frac{a}{b}\right)^r = \frac{a^r}{b^r}$$

$$(15) \quad a^0 = 1$$

$$(16) \quad a^{-r} = \frac{1}{a^r}$$

$$(17) \quad \sqrt[r]{a} = a^{\frac{1}{r}}$$

$$(18) \quad \sqrt[s]{a^r} = a^{\frac{r}{s}}$$

Regler for rødder

Eksempler mm.

$$(2x \cdot y^2)^3 = 2^3 \cdot x^3 \cdot (y^2)^3 = 8 \cdot x^3 \cdot y^{2 \cdot 3} = \underline{\underline{8x^3y^6}}$$

$$(y^2)^3 = y^2 \cdot y^2 \cdot y^2 = y \cdot y \cdot y \cdot y \cdot y \cdot y = y^6$$

$$\left(\frac{2x^{\frac{1}{2}} \cdot y^{\frac{3}{2}}}{x \cdot y} \right)^2 = \frac{(2x^{\frac{1}{2}} y^{\frac{3}{2}})^2}{(x \cdot y)^2}$$

$$= \frac{2^2 \cdot (x^{\frac{1}{2}})^2 \cdot (y^{\frac{3}{2}})^2}{x^2 \cdot y^2}$$

$$= \frac{4 \cdot x^{\frac{1}{2} \cdot 2} \cdot y^{\frac{3}{2} \cdot 2}}{x^2 \cdot y^2} =$$

$$= \frac{4 \cdot x^1 \cdot y^3}{x^2 y^2}$$

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

$$= 4 \cdot x^{-1} \cdot y^1 = \underline{\underline{4x^{-1} \cdot y}}$$

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

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

$$x^{\left(\frac{1}{2}\right)} = \sqrt{x}$$

$$x^{\left(\frac{1}{3}\right)} = \sqrt[3]{x}$$

$$\sqrt[3]{8} = \sqrt[3]{\frac{8}{1}} = \frac{2}{1} = 2$$

$$\sqrt{9} = 3$$

$$\sqrt{9} = 3$$

$$\left(\frac{2x^{\frac{1}{3}} \cdot y^{\frac{4}{3}}}{x \cdot y} \right)^5 = \frac{(2x^{\frac{1}{3}} \cdot y^{\frac{4}{3}})^5}{(x \cdot y)^5}$$

$$= \frac{2^5 \cdot (x^{\frac{1}{3}})^5 \cdot (y^{\frac{4}{3}})^5}{x^5 y^5}$$

$$= \frac{32 \cdot x^{\frac{1}{3} \cdot 5} \cdot y^{\frac{4}{3} \cdot 5}}{x^5 y^5}$$

$$= \frac{32 \cdot x^{\frac{5}{3}} \cdot y^{\frac{20}{3}}}{x^5 y^5}$$

$$= 32 \cdot \frac{x^{\frac{5}{3}}}{x^5} \cdot \frac{y^{\frac{20}{3}}}{y^5}$$

$$= 32 \cdot x^{\frac{5}{3} - 5} \cdot y^{\frac{20}{3} - 5}$$

$$= 32 \cdot x^{\frac{5}{3} - \frac{15}{3}} \cdot y^{\frac{20}{3} - \frac{15}{3}}$$

$$= \frac{32 \cdot x^{-3\frac{1}{3}} \cdot y^{\frac{2}{3}}}{1}$$

$$= \underline{\underline{32 \cdot x^{-\frac{10}{3}} \cdot y^{\frac{2}{3}}}}$$

9.10 b

$$\begin{aligned} \frac{9.10 \text{ b}}{\sqrt[3]{\frac{a^6}{8b^3}}} &= \left(\frac{a^6}{8b^3} \right)^{\frac{1}{3}} = \frac{(a^6)^{\frac{1}{3}}}{(8 \cdot b^3)^{\frac{1}{3}}} = \frac{a^{6 \cdot \frac{1}{3}}}{8^{\frac{1}{3}} \cdot (b^3)^{\frac{1}{3}}} \\ &= \frac{a^2}{2 b^{3 \cdot \frac{1}{3}}} \\ &= \frac{a^2}{2b} \end{aligned}$$

9.10. c

$$\sqrt{16a \cdot \frac{4x^4}{9y^2}}$$

$$= \left(16a \cdot \frac{4x^4}{9y^2}\right)^{\frac{1}{2}} = 16^{\frac{1}{2}} \cdot a^{\frac{1}{2}} \frac{(4x^4)^{\frac{1}{2}}}{(9y^2)^{\frac{1}{2}}}$$

$$= 4 \cdot a^{\frac{1}{2}} \cdot \frac{4^{\frac{1}{2}} \cdot (x^4)^{\frac{1}{2}}}{9^{\frac{1}{2}} \cdot (y^2)^{\frac{1}{2}}} = 4a^{\frac{1}{2}} \frac{2 \cdot x^{4 \cdot \frac{1}{2}}}{3 \cdot y^{2 \cdot \frac{1}{2}}}$$

$$16^{\frac{1}{2}} = \sqrt{16} = 4$$

$$9^{\frac{1}{2}} = \sqrt{9} = 3$$

$$= 4a^{\frac{1}{2}} \frac{2x^2}{3y}$$

$$= \underline{\underline{4a^{\frac{1}{2}} \frac{2x^2}{3y}}} = \underline{\underline{4\sqrt{a} \frac{2x^2}{3y}}}$$