S 148

a) $$\frac{-\frac{0{,}5}{5}-\frac{1}{2yx}}{\frac{xy}{5}+2+\frac{5}{xy}} = \frac{\frac{-xy-5}{10xy}}{\frac{(xy)^2+10xy+5^2}{5xy}} = -\frac{(xy+5)}{10xy}\cdot\frac{5xy}{(xy+5)^2} = \frac{-1}{2\cdot(xy+5)}$$

b) $$\sqrt{x}\cdot\frac{\sqrt[3]{x^2\cdot\sqrt{x}\cdot x^5}}{x^2\cdot\sqrt[6]{x^5\cdot\sqrt[3]{x^2}}}\cdot\sqrt[9]{x} = \frac{x^{1/2}\cdot x^{2/3}\cdot x^{1/12}\cdot x^{5/6}\cdot x^{1/9}}{x^2\cdot x^{5/6}\cdot x^{2/18}} = \frac{1}{\sqrt[4]{x^3}}$$

$$= x^{1/2+2/3+1/12-2} = x^{\frac{6+8+1-24}{12}} = x^{-9/12} = x^{-3/4}$$

c) $$\sqrt[3k]{\left(z^{k-3}\right)^6}\cdot\frac{\left(\sqrt[3]{\sqrt[k]{z^3}}\right)^{3-2k}}{\sqrt[4k]{z^{4k-12}}} = \left(\left(z^{k-3}\right)^6\right)^{1/3k}\cdot\left(\left(\left(z^3\right)^{1/k}\right)^{1/3}\right)^{3-2k}\cdot\left(\left(z^{4k-12}\right)^{1/4k}\right)^{-1}$$

$$= z^{\frac{2k-6}{k}}\cdot z^{\frac{3-2k}{k}}\cdot z^{\frac{-k+3}{k}}$$

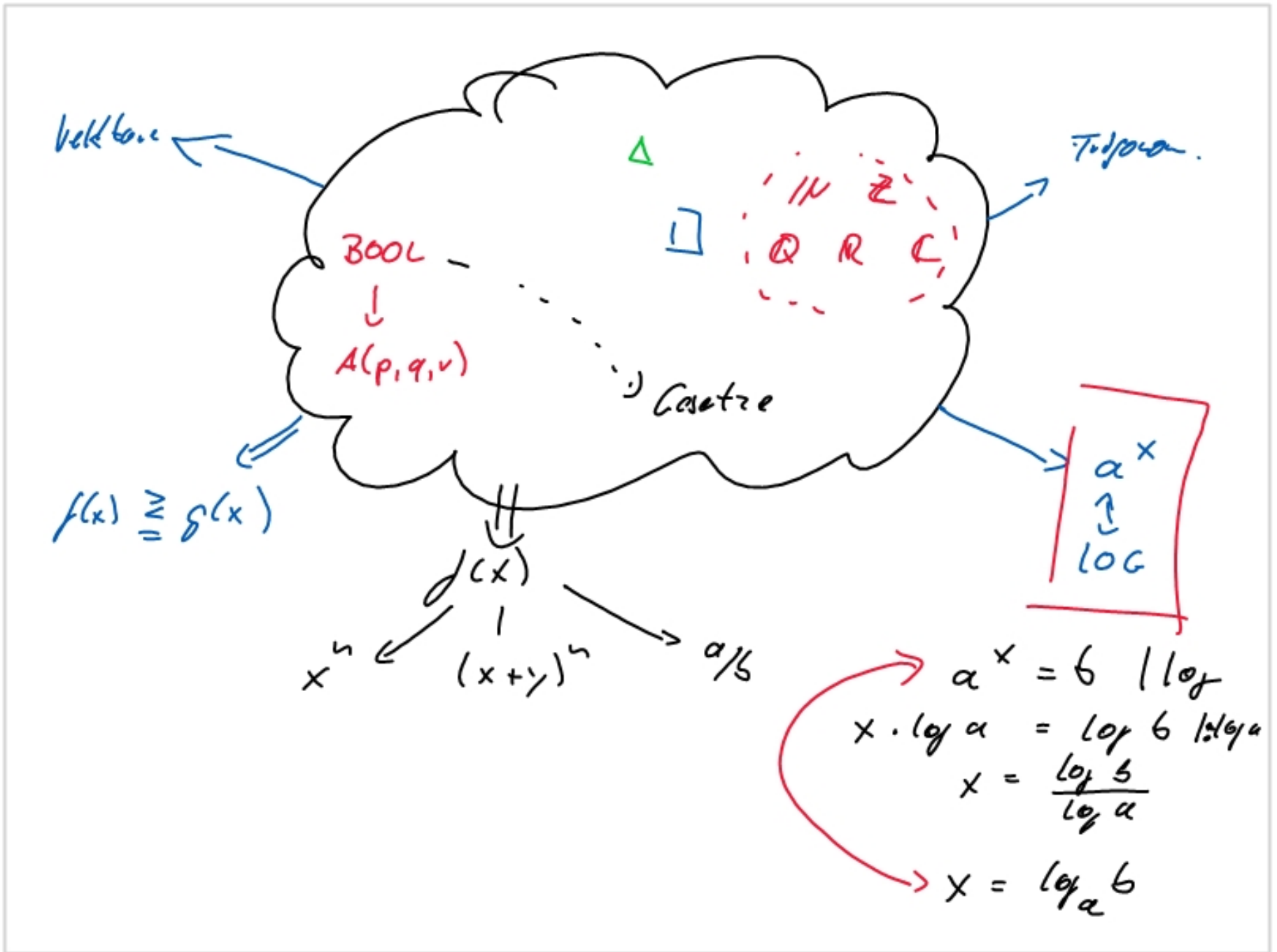
$$= z^{\frac{(2k-6)+(3-2k)+(-k+3)}{k}} = z^{-k/k} = z^{-1} = \frac{1}{z}$$

d) $\frac{9\cdot(0{,}5\cdot x^2\cdot y^{-2}\cdot z)^4}{54\cdot(4\cdot x^{-2}\cdot y^3\cdot z^{-2})^{-3}}\cdot\frac{36\cdot(2\cdot x^2\cdot y^5\cdot z^{-4})^{-2}}{16\cdot(3\cdot x^4\cdot y^3 z^{-4})^{-3}}$ ($0{,}5 = 2^{-1}$)

$$\frac{3^2\cdot 2^{-4}x^8y^{-8}z^4\,(3^2\cdot 2^2)\,2^{-2}x^{-4}y^{-10}z^8}{(2\cdot 3^3)\cdot 2^{-6}x^6y^{-9}z^6\,2^4\,3^{-3}x^{-12}y^{-9}z^{12}}$$

$$\frac{3^2\,3^2\,2^2\,2^6\,3^3}{2^4\,2^2\,2\cdot 3^3\,2^4}\cdot\frac{x^8z^4z^8y^9x^{12}y^9}{y^8x^4y^{10}x^6z^6z^{12}}$$

$$\frac{3^4}{2^3}\cdot\frac{x^{10}y^0}{z^6}=81/8\cdot\frac{x^{10}}{z^6}$$


BOOL
A(p,q,v)
Castre
f(x) ≥ g(x)
f(x)
x^n
(x+y)^n
a/b
a^x
log
a^x = b | log
x · log a = log b : log a
x = log b / log a
x = log_a b

S 151

1) $3 \cdot \log(x-y) + \log(x+y) - 1/2 \cdot \log(x-y)^4$

$\log(x-y)^3 + \log(x+y) - \log(x-y)^2 = \log \frac{(x-y)^3 \cdot (x+y)}{(x-y)^2} = \log(x^2-y^2)$ $\quad (x-y)$

2) $2\ln(2x) - 3\ln 2 + 4 \cdot \ln\sqrt{x} + 2 \cdot \ln(4/x^2)$

$\ln(2x)^2 - \ln 2^3 + \ln(x^{1/2})^4 + \ln(4/x^2)^2$

$\ln \frac{4x^2 \cdot x^2 \cdot 16/x^4}{8} = \ln 8$

3) $\log \sqrt[5]{\frac{x^3 y^2}{3 \cdot (x+y^2)}} = \log \frac{x^{3/5} \cdot y^{2/5}}{3^{1/5} \cdot (x+y^2)^{1/5}} = \log x^{3/5} + \log y^{2/5} - \log 3^{1/5} - \log(x+y^2)^{1/5}$

$= 3/5 \log x + 2/5 \log y - 1/5 \log 3 - 1/5 \log(x+y^2)$

4) $\ln \left(\frac{2 \cdot \sqrt{a-25}}{c^2 \sqrt[4]{d}} \right)^3 = \ln \left(\frac{2^3 \cdot (a-25)^{3/2}}{c^6 d^{3/4}} \right) = \ln 2^3 + \ln(a-25)^{3/2} - \ln c^6 - \ln d^{3/4}$

$= 3 \cdot \ln 2 + 3/2 \cdot \ln(a-25) - 6 \cdot \ln c - 3/4 \ln d$