

## WorkSheet2

1. Use the laws of logarithms to completely expand  $\ln\left(\frac{2(x-1)^4}{\sqrt{(x^2+1)}}\right)$ .
2. Express as a single logarithm the quantity  $3\ln(x) - \frac{1}{2}\ln(x^4 + 1)$ .
3. Differentiate the following.
  - (a)  $g(\theta) = \ln(\cos(\theta))$
  - (b)  $f(u) = \frac{\ln(u)}{1+\ln(2u)}$
  - (c)  $y = \frac{(x-2)^3 \sin^2(x)}{\sqrt[3]{x}}$
4. Integrate the following.
  - (a)  $\int \tan(x) dx$ .
  - (b)  $\int_1^2 \frac{4+u^2}{u^3} du$
  - (c)  $\int_e^6 \frac{dx}{x \ln(x)}$