Essential Skills for Chapter 6

1. Find composite functions and their domains

   EG For $f(x) = \frac{1}{x+3}$ and $g(x) = \frac{1}{x-2}$ find $f \circ g$ and its domain.

2. Find inverse functions

   EG For $f(x) = \frac{1}{3x-2}$ find f^{-1} and its domain and range.

3. Sketch the graph of an exponential function.

   EG $f(x) = 4 - e^{-x}$.

4. Graph logarithm function:

   EG $f(x) = 3 - \ln(x+1)$

5. Simplify logarithm expressions:

   EG $20 \log_2 \sqrt[4]{x} + \log_2 (4x^3) - \log_2 4$

6. Solve equations involving logarithms.

   EG Solve $\log_{15} x + \log_{15} (x-2) = 1$

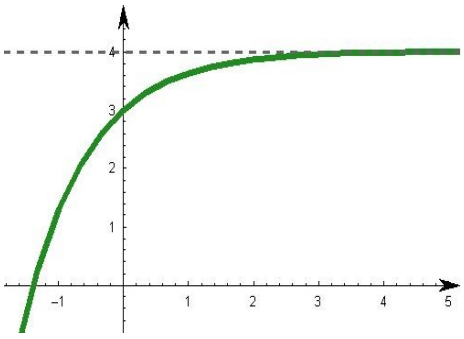
7. Solve exponential equations:

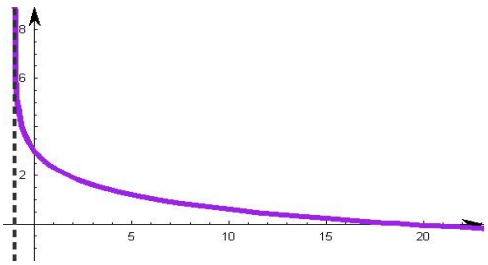
   EG $2^{x+3} = 5^x$.

Answers:

1. $f(g(x)) = \frac{x-2}{3x-5}$ for $x \neq 2, \frac{5}{3}$

2. $f^{-1}(x) = \frac{1+2x}{3x}$

3. 

4. 

5. $8 \log_2 x$

6. $x = 5$

7. $x = \frac{3 \ln 2}{\ln 5 - \ln 2}$