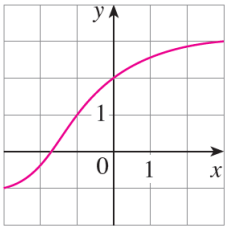

Exercise 1 If $f(x) = x^5 + x^3 + x$, find $f^{-1}(3)$ and $f(f^{-1}(2))$.

Exercise 2 The graph of f is given.



(a) Why is f one-to-one?
(b) What are the domain and range of f^{-1}?
(c) What is the value of $f^{-1}(2)$?
(d) Estimate the value of $f^{-1}(0)$.

Exercise 3 Find a formula for the inverse of the function

$$f(x) = \frac{4x - 1}{2x + 3}$$

Exercise 4 Find a formula for the inverse of the function

$$y = \frac{1 - e^{-x}}{1 + e^{-x}}$$

Exercise 5 Let $f(x) = 1 + e^{-x}$ be a function with the domain $(-\infty, \infty)$. Find an explicit formula for f^{-1} and use it to graph f^{-1}, f, and the line $y = x$ on the same coordinate plane.

Exercise 6 Make a rough sketch of the graphs of the functions $y = -\ln(x)$ and $y = \ln(x^2)$.

Exercise 7 Let $f(x) = \ln(x-1) - 1$ be a function.

(a) What are the domain and range of f?
(b) What is the x-intercept of the graph of f?
(c) Sketch the graph of f?

Exercise 8 Solve each equation for x.

(a) $\ln(x^2 - 1) = 3$

(b) $e^{2x} - 3e^x + 2 = 0$

(c) $\ln(\ln(x)) = 1$

Exercise 9 Find the exact value of each expression.

(a) $\log_5(\frac{1}{125})$ (b) $\ln(\frac{1}{e^2})$

(c) $e^{-\ln(2)}$ (d) $e^{\ln(\ln(e^3))}$

Exercise 10 Find the exact value of each expression.

(a) $\tan^{-1}(\sqrt{3})$ (b) $\arctan(-1)$

(c) $\sin^{-1}(-\frac{1}{\sqrt{2}})$ (d) $\cos^{-1}(\frac{\sqrt{3}}{2})$

(e) $\arcsin(\sin(\frac{5\pi}{4}))$ (f) $\cos(2\sin^{-1}(\frac{5}{13}))$