Math 131 - January 25, 2015
Solutions

Warm-up Problems

1. For each of the exponential functions, convert it to the form $y = Ae^{kx}$.

   (a) $y = 5^x$ **Solution:** $y = e^{(\ln 5)x}$

   (b) $y = 5^{2x}$ **Solution:** $y = e^{(2\ln 5)x}$

   (c) $y = 13 \cdot 5^x$ **Solution:** $y = 13e^{(\ln 5)x}$

   (d) $y = 13 \cdot 5^{2x}$ **Solution:** $y = 13e^{(2\ln 5)x}$

2. Determine which, if any, of the functions below are the same functions.

   (a) $f(x) = x^3$

   (b) $g(w) = w^3$

   (c) $h(z) = \frac{z^4 - z^3}{z-1}$

   (d) $Q(T) = \sqrt{x^6}$

   Solution: f and g are the same. The others are different.

3. Fill in the table (convert between degrees and radians):

Radians	0	π	$\pi/6$	$\pi/2$	$3\pi/4$	2π
Degrees	0	180	30	90	135	360

Lecture Problems

4. For the given functions, find an algebraic expression for the inverse function.

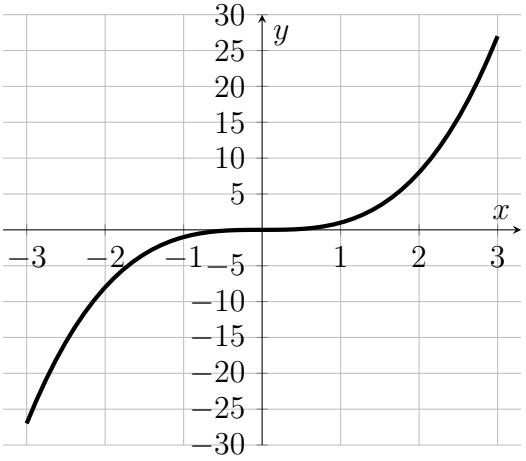
   (a) $f(x) = 3x + 2$
   Solution: $f^{-1}(x) = (x - 2)/3$

   (b) $f(x) = \sin x$
   Solution: DNE

   (c) $f(x) = x^3 - 1$
   Solution: $f^{-1}(x) = (x + 1)^{1/3}$

   (d) $f(x) = (2x - 1)/(4x + 5)$
   Solution: $f^{-1}(x) = (5y + 1)/(2 - 4y)$

5. A graph of $f(x)$ is given below.



(a) $f(2) = 8$

(b) $f(3) = 27$

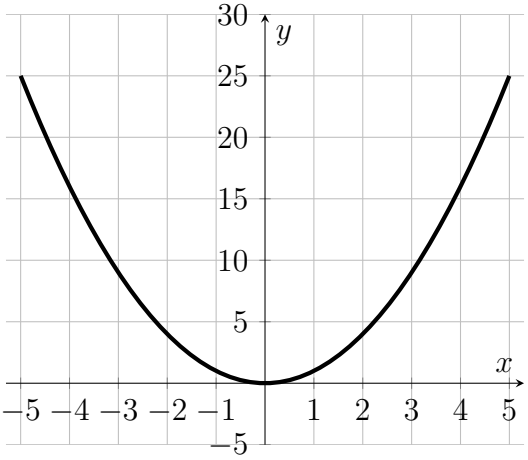
(c) $f^{-1}(0) = 0$

(d) $f^{-1}(5) = 1.7$

(e) $f^{-1}(-15) = -2.5$

(f) $f^{-1}(20) = 2.7$

6. A graph of $f(x)$ is given below.



(a) $f(2) = 4$

(b) $f(3) = 9$

(c) $f^{-1}(0) = 0$?

(d) $f^{-1}(5) =$??

(e) $f^{-1}(-15) =$??

(f) $f^{-1}(20) =$??