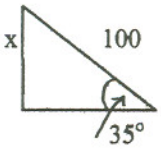
Calculus I Chapter 1 Practice Problems Name Solution Key

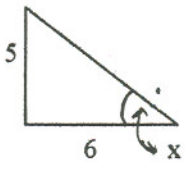
1. Use your calculator to find the value for x accurate to 2 decimal places for each of the following triangles:

a)



$x \doteq 57.36$

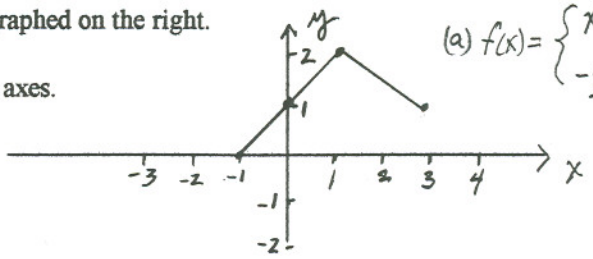
b)



$x \doteq .69 \text{ rads} \doteq 39.81 \text{ degs}$

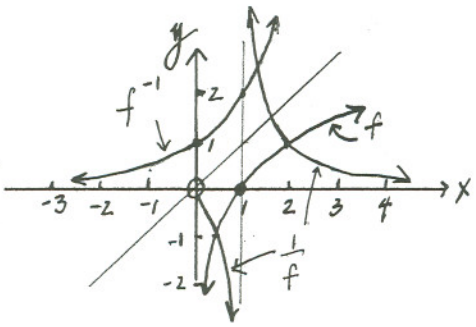
2. a) Write equations defining the piecewise function graphed on the right.

b) Sketch the graph for $y = -f(x+1)$ on the same axes.



(a) $f(x) = \begin{cases} x+1; & -1 \le x \le 1 \\ -\frac{1}{2}x + \frac{5}{2}; & 1 \le x \le 3 \end{cases}$

3.



The graph of y = f (x) is shown on the left.
a) Plot the graph of $y = f^{-1}(x)$ (inverse) and
b) Plot the graph of y = 1 / f (x) on the same axes.

4. If $g(x) = \begin{cases} 1-x, & x \le 1 \\ x + \dfrac{1}{x}, & x > 1 \end{cases}$ and f(x) is defined by the table

x	0	1	2	3
$f(x)$	3	2	1	5

then find a) $(g \circ f)(0)$, b) $g(f(2))$, c) $(f \circ f)(1)$, d) $(g+f)(2)$.

$= 10/3$ $= 0$ $= 1$ $= 3.5$

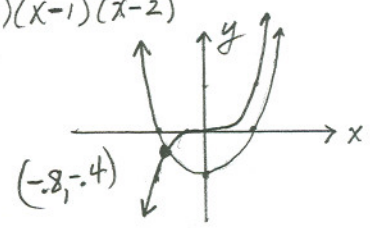
5. If $f(x) = \sqrt{1-x}$ and $g(x) = \cos(x)$

(a) find $(f \circ g)(x)$ and state its domain and range, and $\sqrt{1-\cos(x)}$; $D = (-\infty, \infty)$; $R = [0, \sqrt{2}]$

(b) find $(g \circ f)(x)$ and state its domain and range. $\cos(\sqrt{1-x})$; $D = (-\infty, 1]$; $R = [-1, 1]$

6. Find the formula for and graph the 3rd degree polynomial satisfying
$f(-1) = f(1) = f(2) = 0$; $f(0) = -1$.

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



7. Use your calculator to graph $y = x^3$ and $y = x^2 - 1$ on the same axes and determine any points of intersection to 1 decimal place.

8. (a) Find the exponential function of the form $y = Ca^x$ going through the points (1 , 2) and (2 , 1). $y = 4\left(\frac{1}{2}\right)^x$

(b) A rancher has 100 cattle. The herd doubles every 3 years. How many cattle will there be in 9 years? How many cattle will there be in t years? How many cattle will there be in 50 years? $\doteq 10{,}403{,}192$

(800)

$P(t) = 100 \cdot 2^{t/3}$

9. a) If $\log_a(x) = 2$ and $\log_a(y) = 3$, find $\log_a(x / y^2)$. $= -4$

b) Solve for x if $-10 = 2 + 5(1 - e^{-x})$.

$x \doteq -1.22$