## Worksheet 1 - Functional Notation (§3.2)

1. Let $h(x)=-3, f(x)=\sqrt{x-3}$, and $k(x)$ be represented by the graph at the right. Compute the following.
(a) $h(7)$
(c) $f(7)$
(e) $k(2)$
(b) $h(123,456)$
(d) $x$, if $f(x)=5$
(f) $x$, if $k(x)=0$
2. Let $f(x)=x^{2}-2$ and $g(x)=2 x-3$. Compute and simplify/expand the following expressions.
(a) $f(a)$
(c) $g(x-2)$
(b) $f(a+1)$
(d) $g(x+h)-g(x)$
3. Compute and simplify/reduce the expression $\frac{f(x+h)-f(x)}{h}$ for the following
 functions.
(a) $f(x)=5-3 x$
(c) $f(x)=-x^{2}+2 x$
(e) $f(x)=\sqrt{x}$
(b) $f(x)=6$
(d) $f(x)=x^{3}$
(f) $f(x)=\frac{1}{x}$
4. Determine the domain of the following functions.
(a) $f(x)=x^{4}-x^{3}-3 x$
(e) $f(x)=\sqrt{3-x}$
(i) $f(x)=\frac{6}{\sqrt{6 x-2}}$
(b) $f(x)=\frac{x-2}{x+1}$
(f) $f(x)=\frac{1}{\sqrt{3-x}}$
(j) $f(x)=\frac{1}{5-\sqrt{x}}$
(c) $f(x)=\frac{2 x}{x^{2}+4}$
(g) $f(x)=\sqrt[3]{3-x}$
(k) $f(x)=\frac{6}{4-\sqrt{6 x-2}}$
(d) $f(x)=\frac{x+4}{x^{2}-36}$
(h) $f(x)=\frac{3 x}{x^{2}+x-2}$
(l) $f(x)=\sqrt{x-7}+\sqrt{9-x}$
5. The amount of unconverted substance remaining after a chemical reaction begins is modeled by the formula $U(t)=\frac{60}{1+5 t}$, there $U$ is in grams and $t$ is in seconds. Compute $U(0)$ and interpret its meaning. Then solve $U(t)=10$ and interpret its meaning.
6. The height of an object dropped from the roof of an eight story building is modeled by: $h(t)=-16 t^{2}+64,0 \leq t \leq 2$. Here, $h$ is the height of the object off the ground, in feet, $t$ seconds after the object is dropped. Compute $h(0)$ and solve $h(t)=0$. Interpret your answers to each.
7. The temperature $T$ in degrees Fahrenheit of a Canadian city $t$ hours after 6 AM is given by $T(t)=-\frac{1}{2} t^{2}+8 t+3$ for $0 \leq t \leq 12$. Compute and interpret $T(0), T(6)$, and $T(12)$.
8. The python population of a certain Florida county is modeled by: $P(t)=\frac{150 t}{t+15}$, where $t$ represents the numbers of years since the year 1800. Compute and interpret $P(0)$ and $P(205)$.
