Domain and Range revisited

To determine
  a) sketch the function and look for maximums and minimums
  b) look for division statements or variables under square root signs

Work sheet   Use your graphing calculator as needed.

Short Answer

1. For the function $g(x) = -x^2 + 3x$, find:
   (a) $g(-2)$ -10
   (b) $g(3)$ 0
   (c) $g(a+1)$ $-a^2 + a + 2$
   (d) $g(2-m)$ $-m^2 + m + 2$

2. Given $f(x) = x^2 + 6x - 5$, find:
   (a) $f(0)$ -5
   (b) $f(2+a)$ $a^2 + 10a + 11$
   (c) $f\left(\sqrt{a}\right)$ $a + 6\sqrt{a} - 5$
   (d) $f\left(1+\sqrt{a}\right)$ $a + 8\sqrt{a} + 2$

3. Given $f(x) = 2x^2 - 5x$, evaluate
   (a) $f(-1)$ 7
   (b) $f(2)$ -2
   (c) $f(a)$ $2a^2 - 5a$
   (d) $f(x+1)$ $2x^2 - x - 3$
   (e) $\dfrac{f(x+3)-f(x)}{3}$ $4x+1$

4. Determine the domain and range of the following equations. (You may wish to use your graphing calculator.)
   (a) $y = x^2 - 5$ $\{x \mid x \in R\}$ $\{y \mid y \geq -5, y \in R\}$
   (b) $x^2 + y^2 = 9$ $\{x \mid -3 \leq x, x \in R\}$ $\{y \mid -3 \leq y \leq 3\}$
   (c) $y = 2x^2 - 6x + 7$ $\{x \mid x \in R\}$ $\{y \mid y \geq 25, y \in R\}$
   (d) $f(x) = \dfrac{2}{x^2}$ $x + y \neq 0$
   (e) $g(x) = \sqrt{x-3}$ $\{x \mid x \geq 3, x \in R\}$ $\{y \mid y \geq 0, y \in R\}$

Problem

5. A ball is thrown upward with a velocity of 8 m/s from a bridge that is 50 m above the water. The height of the ball, h, in metres, at time, t, in seconds is given by $h = -4.9t^2 + 8t + 50$.
   (a) When will the ball hit the water? $4.1s$
   (b) When will the ball pass the bridge? $1.6s$