

1. Graph  $f(x) = -25x^2 + 50x + 100$  in GeoGebra and use the software to determine the intercepts, vertex, domain, and range of the function.
  
2. Let  $f(x) = -0.231x^2 - 0.03x + 1.2$  and  $g(x) = 0.003x^2 + 0.001x - 0.3$ . Graph both functions in GeoGebra and then determine the points of intersection of the two functions.
  
3. Given  $g(x) = -6x^2 + 4x - 5$  and  $f(x) = 2x - 7$ , use GeoGebra to determine the following:
  - a. The points of intersection.
  - b. Solve  $g(x) = f(x)$ .
  - c. Solve  $g(x) \geq f(x)$ .
  - d. Solve  $g(x) < f(x)$ .
  
4. Use GeoGebra to solve  $x^3 + 2x^2 - 5 = x + 1$ .
5. Use GeoGebra to solve the inequality  $x^2 - 4x + 7 > 12$ .

6. Given  $f(x) = 2x^2 - 5x + 7$ , simplify the following expressions.

a.  $f(x + 3)$

c.  $f(-4x)$

b.  $f(x) + 3$

d.  $-4f(x)$

7. Given  $g(x) = \frac{-x}{x + 6}$ , simplify the expression  $3g(-2x + 1) - 2$

8. The area of a circle can be described as a function of its radius via  $A(r) = \pi r^2$ . Suppose that the radius of a circle is increasing with time such that  $r = 2t$  where the radius is measured in meters and  $t$  is measured in seconds. Find  $A(2t)$  in terms of  $t$  and describe what this variation of  $A$  represents.