1. Let \( f(x) = x^2 - 2x - 8 \).
   (a) Find the \( x \)-intercepts of \( f \) by setting the formula equal to 0 and solving for \( x \).
   (b) Find the \( x \)-intercepts of \( f \) by using the quadratic formula.
   (c) Find the \( x \)- and \( y \)-coordinates of the vertex of \( f \).
   (d) Is \( f \) concave up or concave down?
   (e) Sketch the graph of \( f \) using your answers to parts (a)–(d).

2. Let \( f(x) = -(x + 2)^2 + 9 \).
   (a) Find the \( x \)-intercepts of \( f \) by setting the formula equal to 0 and solving for \( x \).
   (b) Find the \( x \)-intercepts of \( f \) by writing \( f \) in the form \( ax^2 + bx + c \) and using the quadratic formula.
   (c) Which of the methods in parts (a) and (b) do you find easier?
   (d) Find the \( x \)- and \( y \)-coordinates of the vertex of \( f \).
   (e) Is \( f \) concave up or concave down?
   (f) Sketch the graph of \( f \) using your answers to parts (a)–(e).

3. Suppose \( f(x) = a(x - h)^2 + k \) for some constants \( a \), \( h \), and \( k \). What are the \( x \)- and \( y \)-coordinates of the vertex of \( f \)?

4. Let \( f(x) = 2(x + 3)(x - 7) \).
   (a) Find the \( x \)-intercepts of \( f \) by setting the formula equal to 0 and solving for \( x \).
   (b) Find the \( x \)-intercepts of \( f \) by writing \( f \) in the form \( ax^2 + bx + c \) and using the quadratic formula.
   (c) Which of the methods in parts (a) and (b) do you find easier?
   (d) Find the \( x \)- and \( y \)-coordinates of the vertex of \( f \).
   (e) Is \( f \) concave up or concave down?
   (f) Sketch the graph of \( f \) using your answers to parts (a)–(e).

5. Suppose \( f(x) = a(x - r)(x - s) \) for some constants \( a \), \( r \), and \( s \). What are the \( x \)-intercepts of \( f \)?