9.5 In-class Practice Math 085

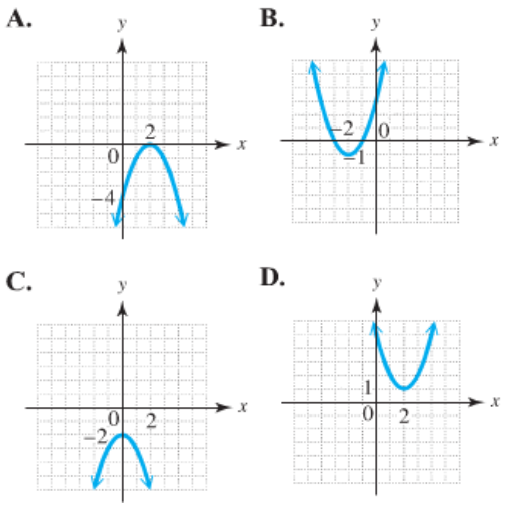
1. Match each quadratic function with its graph.

   a) $f(x) = -x^2 - 2$

   b) $f(x) = (x+2)^2 - 1$

   c) $f(x) = (x-2)^2 + 1$

   d) $f(x) = -(x-2)^2$



2. Identify the **vertex** of each parabola and tell whether the graph **opens up or down** and whether the graph is wider, narrower, or the same **shape** as the graph of the basic parabola $f(x) = x^2$.

   a) $f(x) = \frac{1}{2}x^2 - 4$

   b) $f(x) = (x-2)^2 - 3$

   c) $f(x) = -2(x-3)^2 + 1$

   d) $f(x) = 3(x+1)^2$

   e) $f(x) = 4x^2 + 1$

   f) $f(x) = -\frac{2}{3}(x+3)^2 - 2$

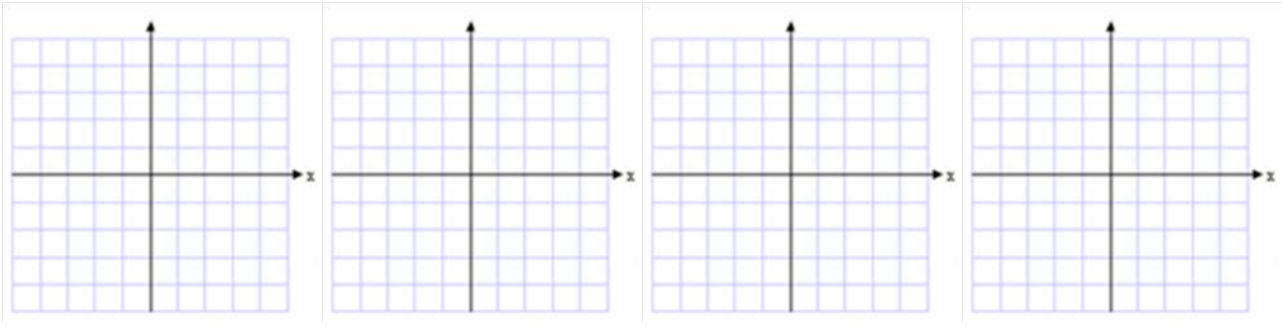
3. Graph each parabola by plotting the vertex and at least two additional points. Give the **vertex**, **axis of symmetry**, **domain**, and **range** of the function.

   a) $f(x) = -2x^2 + 4$

   b) $f(x) = (x-2)^2 - 3$

   c) $f(x) = \frac{1}{2}(x-3)^2 + 1$

   d) $f(x) = -(x+1)^2 - 2$

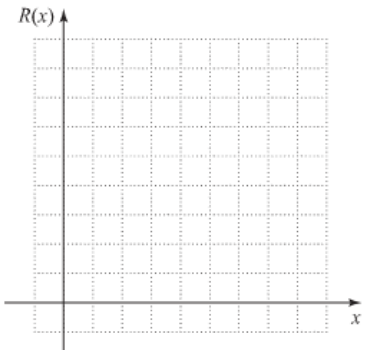


4. A company determines that its daily revenue, R (in dollars), for selling x units of a product is modeled by the function $R(x) = x(120 - x)$.

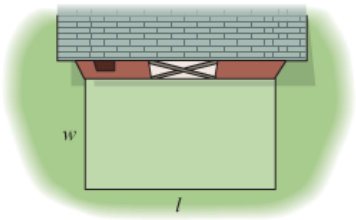
   a. Find the vertex of the graph of this function.

   b. Graph the function.

   c. What number of units must be sold in order to maximize the revenue? What is the maximum revenue?

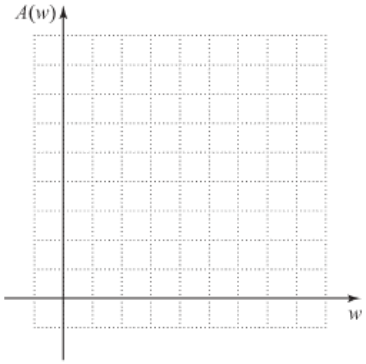


5. A farmer plans to build a rectangular animal pen using the barn as one side, as shown in the figure to the right. The farmer has 300 ft of fencing with which to build the pen.



a. Express the length, l, of the pen in terms of the width, w.

b. Express in function notation the relationship between the area, $A(w)$, and the width, w, of the pen.



c. Graph this function.

d. What dimensions will maximize the area of the animal pen? What is the maximum area?