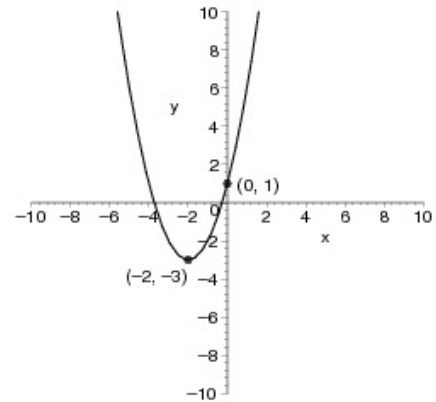
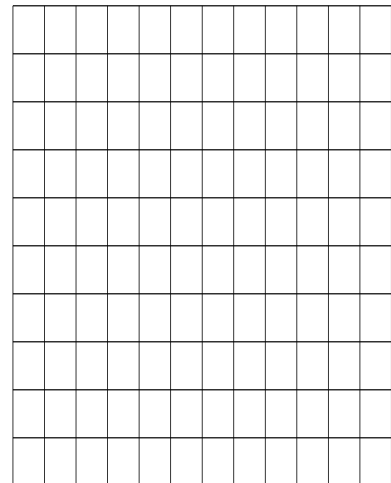


Write complete solutions to the given problems. Be sure to provide all the necessary steps to support your answers.

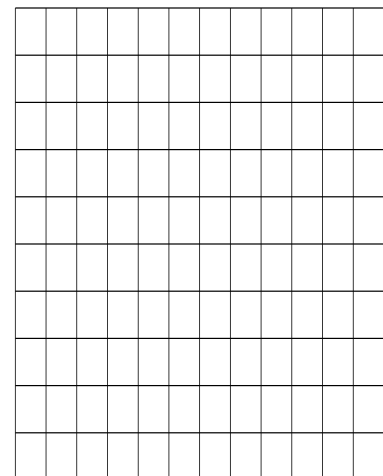
1. Write an equation for the parabola in standard form.



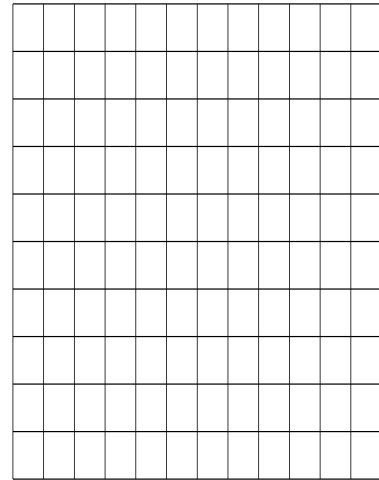
2. Write the standard form of the equation of the parabola that has the indicated vertex and whose graph passes through the given point.  
 Vertex:  $(4, -2)$       point:  $(-1, 4)$



3. Put the given quadratic polynomial in standard form then sketch its graph.  
 $y = -2x^2 - 12x - 22$



4. Find the equation of the parabola that has the intercepts  $(-1,0)$  and  $(3,0)$  and sketch its graph.

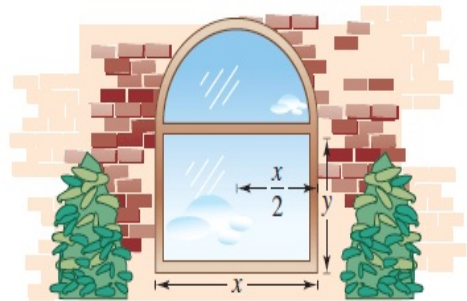


4. The profit  $P$  (in hundreds of dollars) that a company makes depends on the amount  $x$  (in hundreds of dollars) the company spends on advertising according to the model shown below.

$$P = 370 + 40x - 0.5x^2$$

What expenditure for advertising will yield a maximum profit?

5. A Norman window is constructed by adjoining a semicircle to the top of an ordinary rectangular window (see figure). The perimeter of the window is 12 feet.



- a. Write the area  $A$  of the window as a function of  $x$ .
- b. What dimensions will produce a window of maximum area?