Name: **Date:**

Scaffolded Practice: Interpreting Various Forms of Quadratic Functions

Use the given functions to complete all parts of problems 1–3.

1. $f(x) = 2x^2 - 7x - 4$
   a. Identify the *y*-intercept.

   b. Identify the vertex.

   c. Identify whether the function has a maximum or minimum.

2. $f(x) = -\frac{1}{3}(3x+1)(2x-1)$
   a. Identify the *x*-intercepts.

   b. Identify the *y*-intercepts.

   c. Identify the axis of symmetry.

   d. Identify the vertex.

3. $f(x) = -7(x+3)^2 + 5$
   a. Identify the vertex.

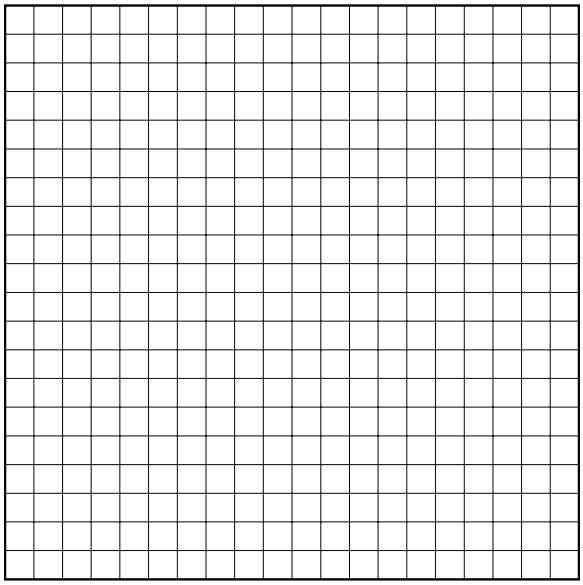
   b. Identify whether the function has a maximum or minimum.

continued

Name: **Date:**

For problems 4–10, use the given information to complete the problems.

4. Aerobatic pilots can maneuver jet planes with impressive control. A popular stunt performed by pilots involves decreasing altitude to a height near the ground and then re-ascending. A particular pilot's path during this stunt is modeled by the function $h(t) = t^2 - 30t + 250$, where h denotes the pilot's height above the ground (in meters) at time t (in seconds). Graph the function, determine its vertex, and interpret the minimum value in this context.

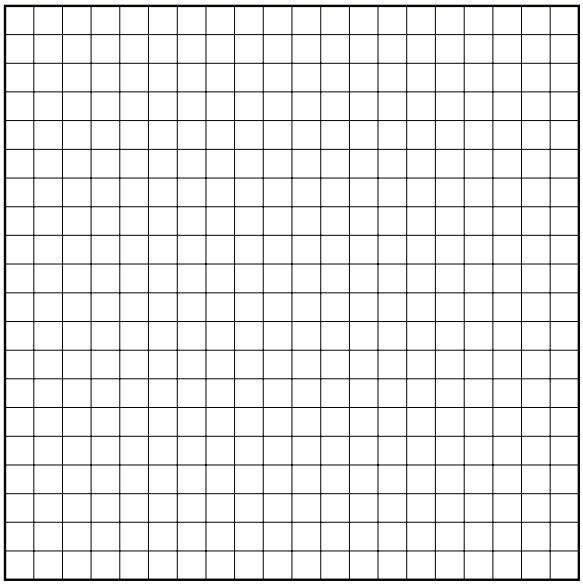


5. Find the maximum or minimum of the function $g(t) = -2(t-2)(t+4)$. What are the coordinates of this point?

6. Find the x-intercepts of the function $f(x) = 2(x+3)(x-3)$.

continued

7. The curveball is an essential pitch in baseball. It follows a parabolic motion in which it "breaks," or descends sharply, after reaching its maximum height, fooling the batter. Suppose a pitcher's curveball follows the path $r(x) = -\frac{1}{400}(x - 40)^2 + 10$, where r denotes the ball's height (in feet) at a given distance x (in feet) away from the pitcher and toward home plate. Graph the function. Then, determine the vertex and interpret it in this context.



8. Determine whether $f(x) = 6(x + 4)(x + 2)$ has a maximum or a minimum. Find the coordinates of that extremum.

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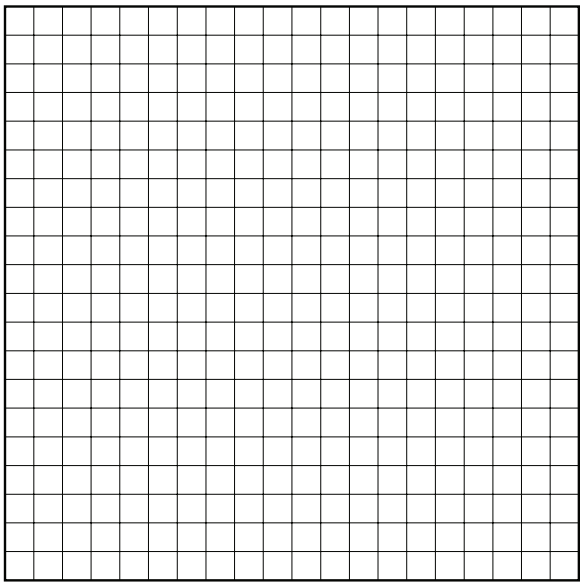
Name: **Date:**

9. A volleyball server must have exceptional precision when serving. Suppose a particular server wants to launch the ball at the farthest corner on the opposing side. Let the function $B(x) = -\frac{1}{9}(x-18)(x+1)$ describe the height B (in meters) of the ball at a given distance x (in meters) from the server. Graph the function. Then, determine the x-intercepts and interpret them in this context.



10. Find the x-intercepts of the function $U(x) = -6(x-7)^2 + 6$.