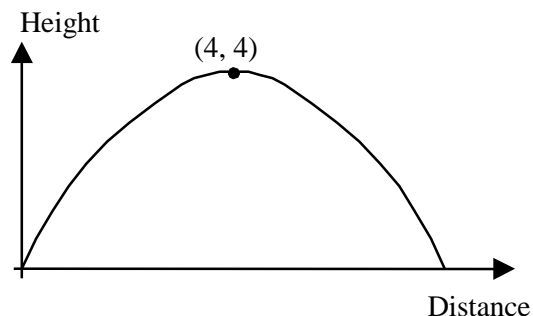


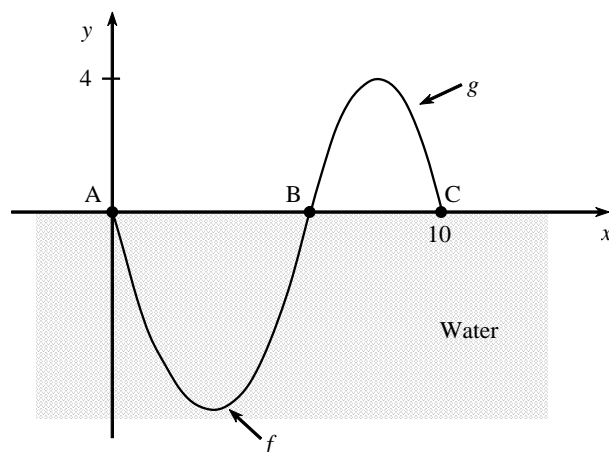
1. The parabolic trajectory (path) of a ball thrown from Pat to Chris is illustrated in the Cartesian diagram below. The maximum height reached by the ball is 4 m.  
Which of the following rules correctly defines this parabola?

- A)  $y = x^2 - 8x$                       C)  $y = -0.25x^2 - 2x$   
B)  $y = -4x^2 + 2x$                       D)  $y = -0.25x^2 + 2x$



2. What is the equation (rule) of the second-degree function that has a range of  $(-\infty, 4]$  and is positive for  $x \in ]-1, 3[$ ?
3. What are the zeros of the function  $f(x) = x^2 - 2x + 1$ ?
4. In a Cartesian plane, function  $f$  is represented by a parabola. Point  $P(-7, 172)$  is one of the points on this parabola, and point  $V(3, -8)$  is its vertex. What is the rule of function  $f$ ?
5. In a Cartesian plane, function  $f$  is represented by a parabola. The zeros of function  $f$  are 10 and 20, and its minimum is  $-75$ . What is the rule of function  $f$ ?

6. The following graph represents the side view of the path of a dolphin as it performs a trick during a show at an aquarium. This path is composed of portions of two parabolas associated with function  $f$  and  $g$  respectively. The scale of the graph is in metres. The rule  $f(x) = \frac{5}{9}(x-3)^2 - 5$  represents the dolphin's path when it



is in the water. When it is out of the water, the dolphin reaches a maximum height of 4 metres. The distance between points A and C is 10 metres. What is the rule of the function  $g$ ?

7. Determine the equation of the second-degree function associated with the description provided.
- a) The vertex is located at  $V(3, 2)$  and the graph passes through the point  $P(4, 3)$ .
- b) The two zeros are  $-3$  and  $1$  and  $f(-1) = 2$ .
- c) The equation of the axis of symmetry is  $x = -1$ . The maximum is  $2$  and the graph passes through the point  $P(4, -123)$ .
- d) The only zero of the function is  $-2$  and  $f(-1) = -1$ .
- e) Points  $P(-1, 7)$ ,  $Q(-9, 7)$  and  $R(-3, 1)$  are on the parabola representing the function.
- f) The y-intercept is greater than or equal to the zeros, which are  $-1$  and  $5$ .