8. Given the function \( f \) has the graph shown at left, which of the following could be the function?

a. \( f(x) = x^4 - 3 \) not even close!

b. \( f(x) = (x-1)^4 - 4 \) ditto!

c. \( f(x) = -x^3 - 3 \)

d. \( f(x) = -(x+1)^3 - 2 \)

e. \( f(x) = -(x-1)^3 - 3 \)

f. \( f(x) = -(x+1)^2 - 2 \) an even function!

9. A right triangle has a vertex at (0,0), one arm on the positive x-axis, and third vertex on the curve: \( y = 4 - x^2 \).
Write a function for the area \( A \) of this triangle in terms of \( x \). What is the domain of this function?

\[
\text{Area of triangle} = \frac{1}{2} \times \text{base} \times \text{height}
\]
\[
= \frac{1}{2} \times (x - 0) \times (4 - x^2 - 0)
\]
\[
= \frac{1}{2} \times x \times (4 - x^2) \quad \text{For } 0 \leq x \leq 2
\]

10. Two adjacent rectangular fields are to be enclosed with 200 yards of fencing—The two fields will be identical rectangles, sharing a side (fence) in the middle. Let \( x \) be the length of fence in the middle.

a. Express the total area enclosed by the fields in terms of \( x \).

\[
\text{Area} = \text{base} \times \text{height}
\]
\[
= \left( \frac{1}{2} \right) \times (200 - 3x) \times x
\]

b. What is the area when \( x = 10 \) ?

\[
\left( \frac{1}{2} \right) (200 - 30) \times 10 = 850 \text{ square yards.}
\]

c. For what value of \( x \) will the area be maximum?

\[
\text{Area is maximum when } x = \frac{100}{3} \text{ yds .}
\]

d. What is the maximum area?

\[
\left( \frac{1}{2} \right) (200 - 3(\frac{100}{3})) \times \frac{100}{3} = \frac{5000}{3} \text{ yd }^2
\]