❦ Quiz 2/21/08 ❧

1. A rectangle has its base (one side) on the x-axis, and two vertices on the graph of $y = 4 - x^2$. Find an expression for the area of this rectangle in terms of x.

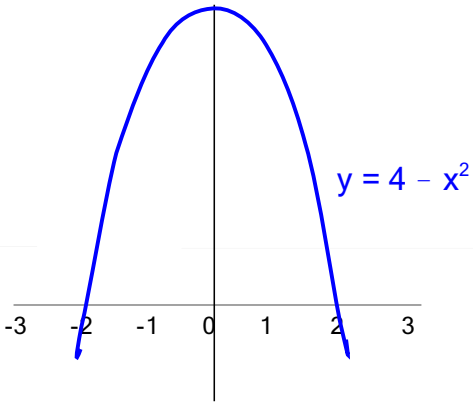
2. Sketch the graphs of :

   a. $y = x^3$

   b. $y = (x+2)^3 - 1$

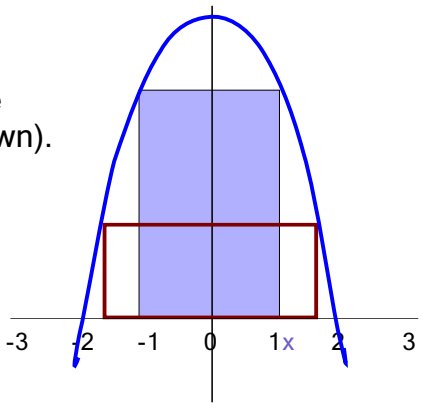
   c. $y = 1 - (x+2)^3$

1. First we sketch the setting.



Since we know $y = x^2$ we readily see that $y = 4 - x^2$ is an inverted parabola raised up 4 units.

Then placing a rectangle with a side on the x-axis, and two vertices on $y = 4 - x^2$, we see the shaded rectangle as one of many possibilities. Another is outlined.



Since we need the area of the rectangle in terms of x, we locate x in this scenario....x (just >1), for the shaded rectangle, is shown). (Where is x for the outlined rectangle ?)

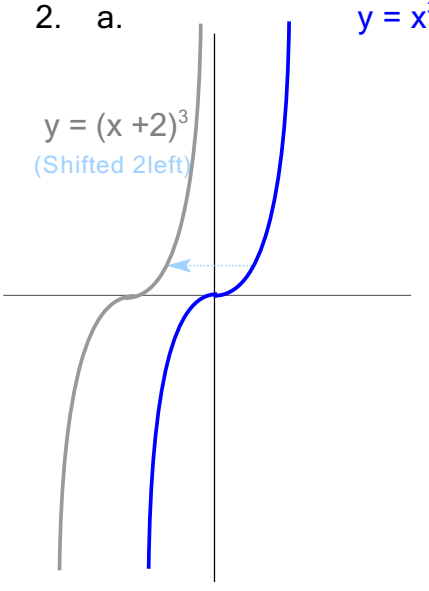
The Area of a rectangle is the product of its two dimensions:

Area = length • height

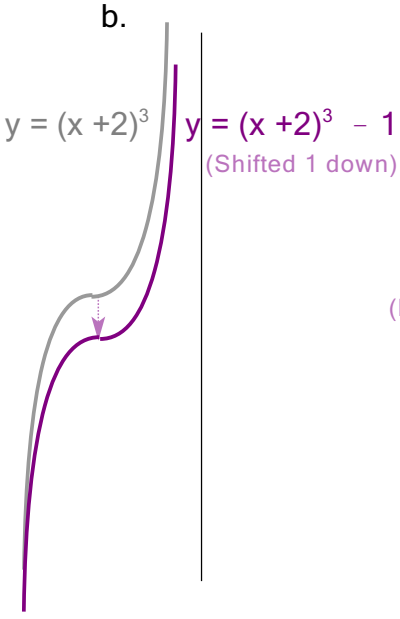
= (2x) • (y)

= 2x (4 – x^2) (for $-2 \le x \le 2$)

2. a. $y = x^3$



b.



c.