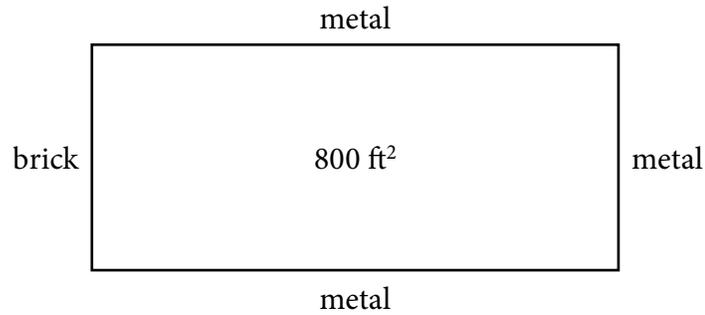


LECTURE NOTES: REVIEW FOR FINAL EXAM (DAY 2)

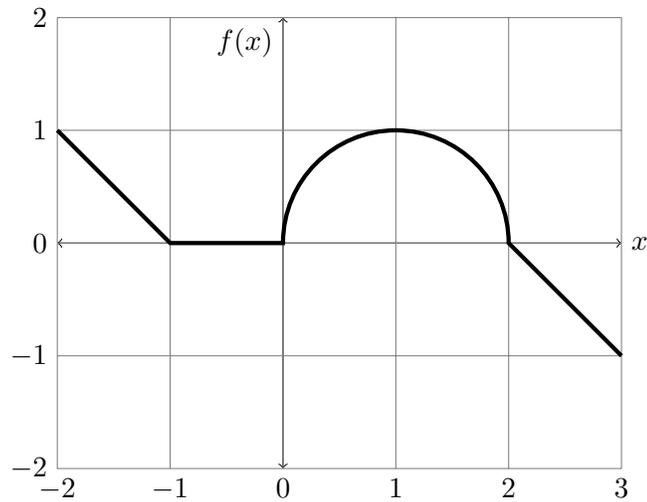
More Sample Problems

1. A landscape architect wishes to enclose a rectangular garden on one side by a brick wall costing \$30 per foot and on the other three sides with a metal fence costing \$10 per foot. The area of the garden is to be 800ft^2 . What are the dimensions of the garden that minimize the cost of the fencing? (For full credit, you must justify your answer.)



2. The function $f(x)$ has been graphed below. The curve for $0 < x < 2$ is an upper half circle. Define a new function $g(x)$, as

$$g(x) = \int_0^x f(s) ds.$$



Use the graph above to answer the questions below.

Note: Pay attention to whether question concerns the function f , f' , g or g' .

(a) What is the value of $f(0)$?

(b) What is the value of $g(3)$?

(c) What is the value of $g(-2)$?

(d) What is the value of $f'(2)$?

(e) What is the value of $g'(1)$?

3. Let $g(x) = \frac{e^x}{1+x}$. Note first and second derivatives are

$$g'(x) = \frac{xe^x}{(1+x)^2} \quad \text{and} \quad g''(x) = \frac{e^x(x^2+1)}{(1+x)^3}.$$

Sketch the graph of $g(x)$. Label any asymptotes, x - and y -intercepts, local minimums and local maximums, and inflection points, if appropriate.