

Set-Up Problems:

1. You have a length of rope 10 m long. You wish to create a square and a triangle with this rope. Create a function to describe the area of these two figures combined, where the input variable x is the length of the side of the square. What is the domain of this function?
2. Section 1.1 28(a, b)
3. I wish to create a box out of aluminum and I have a total of 80 m^2 aluminum to use. The box will have a square base, with length x . I need to make the bottom doubly thick (twice as much material), but the sides and the top are regular. Come up with an equation representing the volume of the box as a function of x . What is the domain of the function?

New Functions from Old

1. Express f as a composition of functions $f = g \circ h$.

$$f(x) = \sqrt{x^4 + 2} \quad f(x) = 4\pi \sin^2 x - 14.5e \sin x + 2\pi$$

2. Explain how to graph the function $f(x)$ starting with a function having a graph more commonly known.

$$f(x) = x^2 - 8x + 3 \quad f(x) = 2 - \frac{1}{x+1}$$

Inverse Functions

1. Find a formula for $f^{-1}(x)$ and state the domain of the inverse function.

$$f(x) = -\sqrt{3 - 2x} \quad f(x) = \frac{5}{(x^2 + 1)}, x \geq 0$$

Exponential and Logarithmic Functions

1. Solve for x without using a calculator.

$$\log_{10} x^{3/2} - \log_{10} \sqrt{x} = 5$$

2. Solve for x without using a calculator.

$$\ln \left(\frac{1}{x} \right) = -2$$

3. Solve for x without using a calculator.

$$e^{2x} - e^x = 6$$

Limits

The limits I will ask you are much like those on your homework. Specifically, study exercises 5–12 in the Chapter 2 review exercises. When the book asks for a horizontal asymptote, notice that what it is really asking for is a limit as $x \rightarrow \infty$.

Continuity

1. Chapter 2 Review Exercises 31, 32 and 33.

Definition of Derivative

I will ask you to find the derivative of a quadratic function using the definition of derivative. So, practice running through the quotient function (you need to remember what it is) and limit calculations.

$$f(x) = 3x^2 - 2x + 7 \quad f'(x) = ?$$