Math-19 Homework #4

Reading

Please read sections 2.1 through 2.7 and do all concept problems in the posted sections on web-assign.

Problems

State all domains in interval notation!

1). Consider the function:

$$y = -\sqrt[3]{x-5} + 1$$

a). List the transformations, starting from a basic function.

b). Determine any x-intercepts.

c). Determine any y-intercepts.

d). Sketch a graph of the function.

e). Determine the domain of the function.

f). Determine the range of the function.

g). On which intervals is the function increasing?

h). On which intervals is the function decreasing?

2). Let:

$$f(x) = \sqrt{x}(x+1)$$
$$g(x) = \sqrt{x}$$

a). Determine $f + g$ and state the domain.

b). Determine fg and state the domain.

c). Determine $\frac{f}{g}$ and state the domain.

d). Determine $\frac{f}{f}$ and state the domain.

3). Let:

$$h(x) = \sqrt[3]{\frac{x+1}{x-1}} - 5$$

Find a suitable $f(x)$ and $g(x)$ such that $h = f \circ g$. Remember, neither is allowed to be just x. Be careful to correctly determine which is the inner function and which is the outer function.

4). Let:

$$f(x) = \frac{1}{x}$$

Compute the difference quotient $\frac{f(x+h)-f(x)}{h}$

5). A certain chemical reaction proceeds at a linear pace with 4kg of product being produced every 30 seconds. At the start of the reaction there was already 2kg of product existing.

a). Express the amount of product at time t (starting at $t = 0$) by a linear equation: $p(t) = At + B$.

b). What does A represent?

c). What does B represent?

d). How much product is there after 15 seconds?