

Name: _____

Solutions

Math 105: Fall 2013
Quiz 1: September 13

Good Luck!

1. Suppose that $p(x)$ is a polynomial of degree 9. Is it possible that $p(x) \leq 13$ for all x ? Why or why not?

No, 9 is an odd number and polynomials of odd degree always have range $(-\infty, \infty)$.
But if $p(x) \leq 13$ for all x , then $p(x)$ doesn't have range $(-\infty, \infty)$.

2. Give the domain of the following functions.

(a) $f(x) = x - 13$ all real numbers

(b) $g(x) = (\sqrt{x-13})^2$ $\{x \mid x \geq 13\}$ or $[13, \infty)$

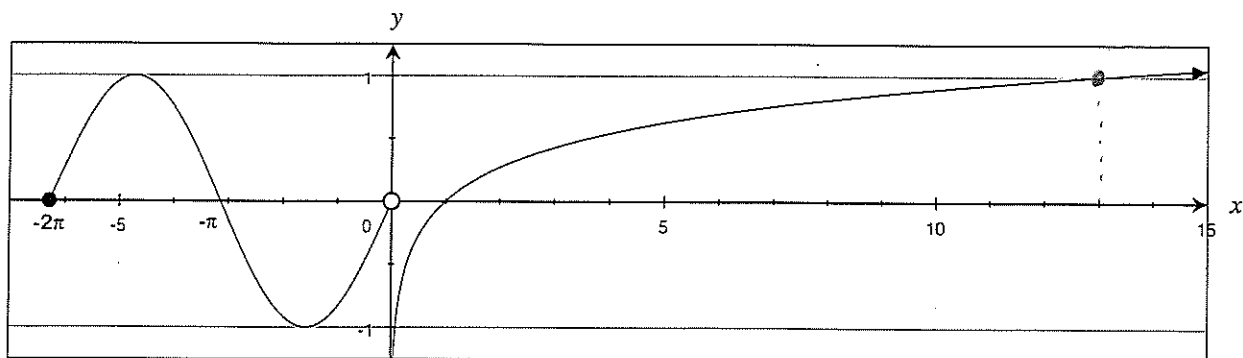
(we can't take the square root of a negative number)

(c) $h(x) = \frac{x^2 - 169}{x + 13}$ $\{x \mid x \neq -13\}$

or
all real numbers except -13

(we can't divide by 0)

3. Write a possible formula for $f(x)$, the piecewise function graphed below.



note: the curve on the right side does NOT intersect the y-axis

$$f(x) = \begin{cases} \sin x & \text{if } -2\pi \leq x < 0 \\ \log_{13} x & \text{if } 0 < x \end{cases}$$

we know this is 13 because the point (13, 1) is on the graph.

4. Consider the graph of $f(x)$ above. For which values of x is $f(x)$ concave down?

$$(-2\pi, -\pi) \text{ and } (0, \infty)$$