PreCalc 11 Final Review Chp 8

Note Title 2016-05-25

8.1) Absolute Value Function.

Piecewise - we need to break up the intervals by positive and negative pieces. The positive pieces stay as the original function; the negative pieces need to be the negative of the original function. To find the breaks between positive and negative, we must find the zeroes of the function. The negative of the function is also called a reflection.

8.2) Solving Absolute Value Equations

We need to solve both cases of $g(x) = |f(x)|$:

$g(x) = f(x)$ & $g(x) = -f(x)$

Then put solutions back into $g(x) = |f(x)|$ to check for extraneous.

If $g(x) < 0$, then solutions are automatically extraneous.

8.3) Graphing Reciprocals of Linear Functions

Reciprocal means to flip the numerator & denominator. Since we have an implied denominator of 1, we are doing $1/f(x)$, where $f(x) = ax+b$ (a line). Unless $f(x) = b$, the range of $f(x) \in \mathbb{R}$.

As $f(x) \to +\infty$, $1/f(x) \to +0$ (small +'ve value)

$\to -\infty$, $\to -0$ (small -'ve value)

$\to +0$, $\to +\infty$

$\to -0$, $\to -\infty$

VA are where $f(x) = 0$.

HA always $y = 0$ (when $a \neq 0$)

Invariant points (when the line meets the reciprocal of the line): happens when $f(x) = 1/f(x)$

$$[f(x)]^2 = 1$$

$$\sqrt{[f(x)]^2} = \pm\sqrt{1}$$

$$f(x) = \pm 1$$

So invariant points happens when $f(x)$ [the y-values] $= \pm 1$

8.4) Graph Reciprocals of Quadratic functions

Predict how many VA's. Depends on the # of zeroes in the denominator.

	General $y=ax^2+bx+c$	Standard $y=a(x-p)^2+q$	Factored $y=a(x-d)(x-e)$
2 VA's:	$b^2-4ac<0$	$a\cdot q>0$	d, e exist & $d \neq e$
1 VA:	$b^2-4ac=0$	$a\cdot q=0$	d, e exist & $d=e$
0 VA's:	$b^2-4ac>0$	$a\cdot q<0$	d, e don't exist

8.5) Graph Reciprocals of Quadratic functions

Same as linear: use zeroes, invariant points and HA: $y=0$. Plus, you need to use the vertex (p,q), just plot $(p, 1/q)$ for the reciprocal. Then draw $x=p$ as the axis of symmetry.

Steps:

1. Draw VA at zeroes of $f(x)$, the quadratic.
2. Draw HA: $y=0$
3. Draw axis of symmetry, use chp 4 notes.
4. Plot invariant points (where the quadratic $=\pm 1$)
5. Plot reciprocal of vertex $(p, 1/q)$.
6. Draw curve from points to asymptote. (do not cross asymptotes, this year).