

AP Calculus AB
Unit 1 - Limits
Absolute Value Functions in Rational Functions

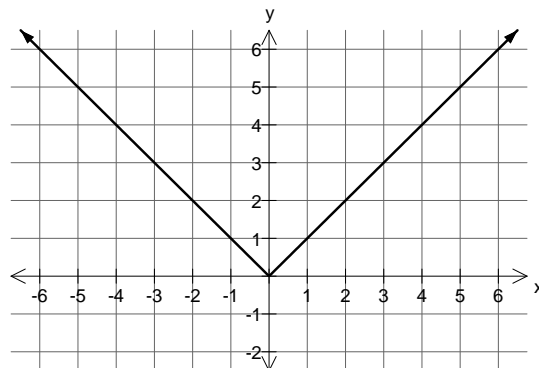
1. Consider the graph of $f(x) = |x|$.

x coordinate of vertex =

When $x < \quad f(x) =$

When $x \geq \quad f(x) =$

→ Definition of $f(x) = |x| = \begin{cases} & ; x < \\ & ; x \geq \end{cases}$



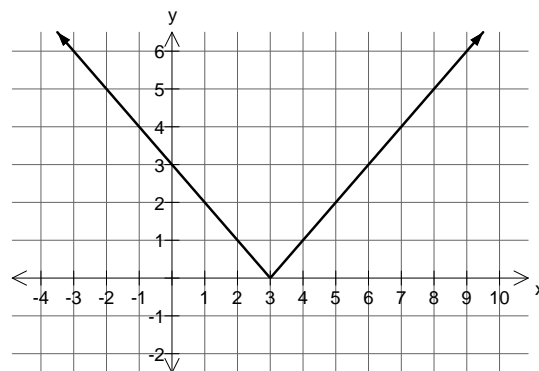
2. Consider the graph of $f(x) = |x - 3|$.

x coordinate of vertex =

When $x < \quad f(x) =$

When $x \geq \quad f(x) =$

→ Definition of $f(x) = |x - 3| = \begin{cases} & ; x < \\ & ; x \geq \end{cases}$



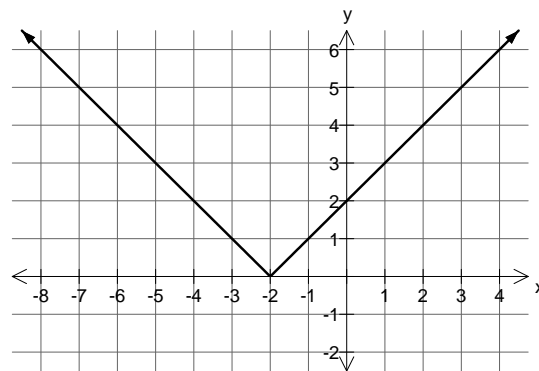
3. Consider the graph of $f(x) = |x + 2|$.

x coordinate of vertex =

When $x < \quad f(x) =$

When $x \geq \quad f(x) =$

→ Definition of $f(x) = |x + 2| = \begin{cases} & ; x < \\ & ; x \geq \end{cases}$



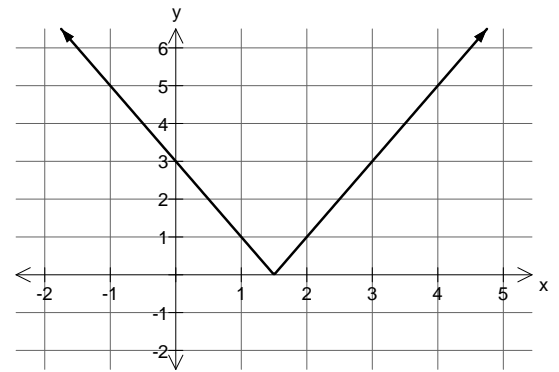
4. Consider the graph of $f(x) = |2x - 3|$.

x coordinate of vertex =

When $x <$ $f(x) =$

When $x \geq$ $f(x) =$

$$\rightarrow \text{Definition of } f(x) = |2x - 3| = \begin{cases} & ; x < \\ & ; x \geq \end{cases}$$

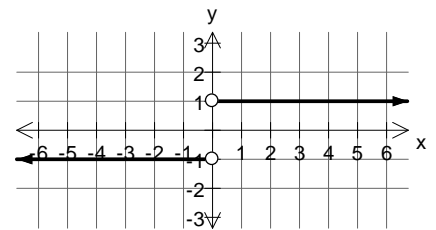


5. Consider the graph of $f(x) = \frac{x}{|x|}$.

The $|x|$ part of $f(x)$ determines the complete definition of the function!!

x coordinate of vertex of $|x| =$

$$f(x) = \frac{x}{|x|} = \begin{cases} x & ; x < \\ & ; x > \end{cases} \rightarrow f(x) = \begin{cases} & ; x < \\ & ; x > \end{cases} \rightarrow f(x) = \begin{cases} & ; x < \\ & ; x > \end{cases}$$

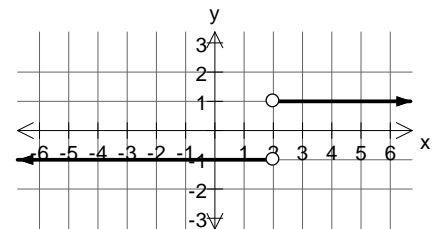


6. Consider the graph of $f(x) = \frac{x-2}{|x-2|}$.

The $|x-2|$ part of $f(x)$ determines the complete definition of the function!!

x coordinate of vertex of $|x-2| =$

$$f(x) = \frac{x-2}{|x-2|} = \begin{cases} & ; x < \\ & ; x > \end{cases} \rightarrow f(x) = \begin{cases} & ; x < \\ & ; x > \end{cases} \rightarrow f(x) = \begin{cases} & ; x < \\ & ; x > \end{cases}$$



7. $f(x) = \frac{2x-3}{|2x-3|} = \begin{cases} & \\ & \end{cases}$