## Big Idea \#1 Limits

| Concept | Question |
| :---: | :---: |
| 1. Properties of Limits | $f(x)$ <br> $g(x)$ <br> The graph of a function $f$ and $g$ are shown above. Find $\lim _{x \rightarrow 2}(f(x)+3 g(x))$ |
| 2. Two-Sided Limits | $\lim _{x \rightarrow 5} \frac{2 x+10}{x^{2}+2 x-15}$ |
| 3. One-Sided Limits |  <br> The graph of a function $f$ is shown above. Find $\begin{aligned} & \lim _{x \rightarrow 5^{-}} f(x)= \\ & \lim _{x \rightarrow 5^{+}} f(x)= \end{aligned}$ |



|  | Let $f(x)$ equal the following piecewise function: $f(x)= \begin{cases}\frac{x^{2}-6 x}{x} & , x \neq 0 \\ 2 k-1 & , x=0\end{cases}$ <br> If $f$ is continuous at $x=0$, then $k=$ |
| :---: | :---: |
| 7. Determining if a function is continuous (using limits) |  <br> The graph of a function $f$ is shown above. If $\lim _{x \rightarrow b} f(x)$ exists and $f$ is discontinuous at $b$, then $b=$ |
| 8. Intermediate Value <br> Theorem <br> *and the script that goes with it | Let $f$ be a continuous function on the closed interval $[-3,6]$. If $f(-3)=-1$ and $f(6)=3$, then the Intermediate Value Theorem guarantees that <br> A. $f(0)=0$ <br> B. $f^{\prime}(c)=\frac{4}{9}$ for at least one $c$ between -3 and 6 <br> C. $-1 \leq f(x) \leq 3$ for all $x$ between -3 and 6 <br> D. $f(c)=1$ for at least one $c$ between -3 and 6 <br> E. $f(c)=0$ for at least one $c$ between -1 and 3 |

