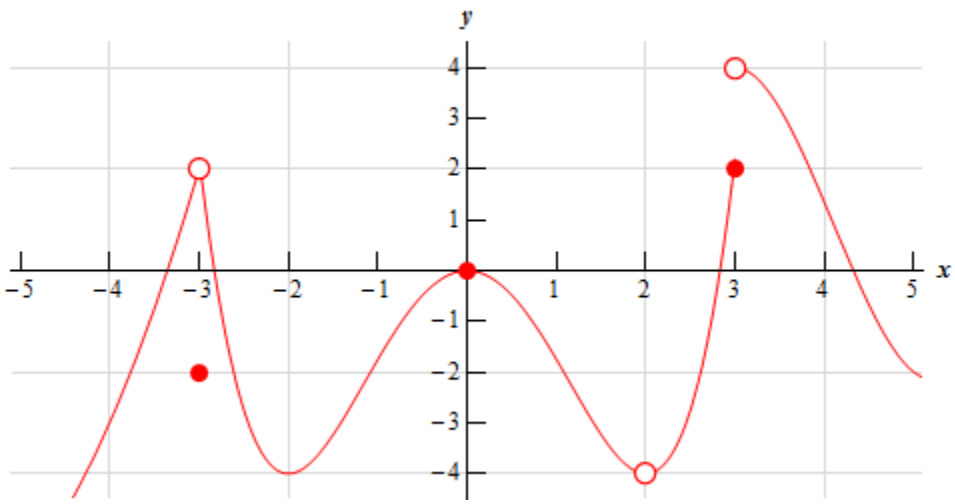
One-Sided Limits

1. The graph of $f(x)$ is shown below. Use the graph to find the value of the function value $f(a)$ and the limits $\lim_{x\to a^-} f(x)$, $\lim_{x\to a^+} f(x)$ and $\lim_{x\to a} f(x)$ for the given value of *a*. If any quantity does not exist clearly indicate that.

(a) $a=-3$ **(b)** $a=0$ **(c)** $a=2$ **(d)** $a=3$



Limit Properties

2. Given that $\lim_{x\to -2} f(x)=8$, $\lim_{x\to -2} g(x)=-1$ and $\lim_{x\to -2} h(x)=7$ evaluate each of the following limits.

(a) $\lim_{x\to -2}\left[9g(x)-2h(x)\right]$

(b) $\lim_{x\to -2}\left[1-5f(x)g(x)\right]$

(c) $\lim_{x\to -2}\dfrac{\left[f(x)\right]^3}{10+h(x)}$

Computing Limits

For problems 3 –5 evaluate the limits, provided it exists. If it doesn't exist clearly explain why it doesn't exist.

3. $\lim_{t\to -3}\dfrac{2t^2+5t-3}{9-t^2}$

4. $\lim_{z\to -1}\dfrac{(z-4)(z+2)+2-3z}{z^2+5z+4}$

Continued on Back $\Rightarrow$

5. $\lim\limits_{y\to 1}\dfrac{2-\sqrt{y^2+3}}{y^2+5y-6}$

6. Evaluate the following two limits using

$$g(x)=\begin{cases}\mathbf{e}^{2+x} & \text{if } x<6\\ x^2-3 & \text{if } x\ge 6\end{cases}$$

(a) $\lim\limits_{x\to 11} g(x)$

(b) $\lim\limits_{x\to 6} g(x)$

7. Evaluate $\lim\limits_{h\to 0}\dfrac{|h|}{h}$. Hint : Recall the definition of the absolute value function.

<u>Infinite Limits</u>

8. Evaluate $\lim\limits_{x\to 7^-}\dfrac{4}{(7-x)^5}$ and $\lim\limits_{x\to 7^+}\dfrac{4}{(7-x)^5}$.

9. Evaluate $\lim\limits_{t\to -3^-}\dfrac{-5}{(2x+6)^2}$ and $\lim\limits_{t\to -3^+}\dfrac{-5}{(2x+6)^2}$.