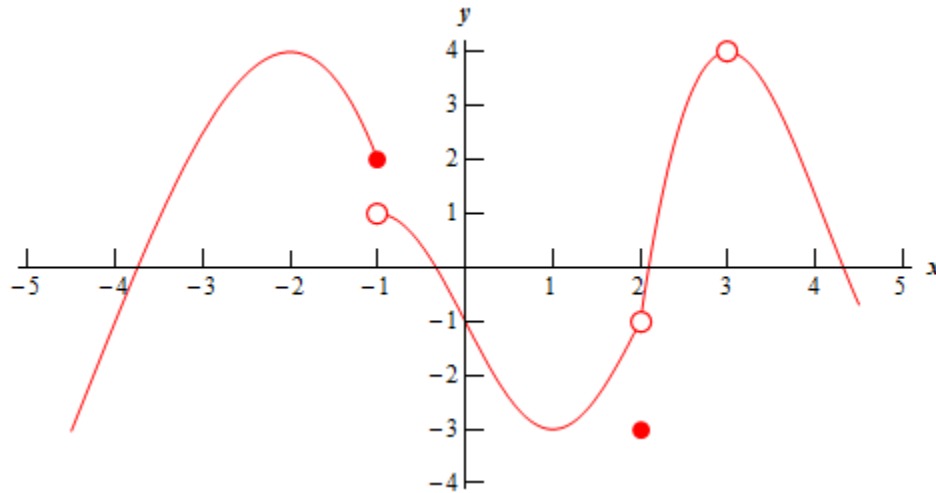


**One-Sided Limits**

1. The graph of  $f(x)$  is shown below. Use the graph to find the value of  $f(a)$ ,  $\lim_{x \rightarrow a^-} f(x)$ ,

$\lim_{x \rightarrow a^+} f(x)$  and  $\lim_{x \rightarrow a} f(x)$  for the given value of  $a$ . If any quantity does not exist clearly indicate that.

(a)  $a = -1$ (b)  $a = 2$ (c)  $a = 3$ **Limit Properties**

2. Given that  $\lim_{x \rightarrow 12} f(x) = 9$ ,  $\lim_{x \rightarrow 12} g(x) = -1$  and  $\lim_{x \rightarrow 12} h(x) = -4$  use the limit properties from this

section to reduce the given limit down to something that will allow you to use the given values. At each step you clearly indicate which limit property you used.

(a)  $\lim_{x \rightarrow 12} [f(x) + 7g(x) - 2]$

(b)  $\lim_{x \rightarrow 12} \frac{g(x)}{[f(x)]^2 - 5h(x)}$

**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.  $\lim_{x \rightarrow 4} \frac{4 + 7x - 2x^2}{x^2 - 16}$

4.  $\lim_{t \rightarrow -3} \frac{(t+1)(t+5) + 3t + 13}{t^2 + 2t - 3}$

5.  $\lim_{y \rightarrow 1} \frac{3y - \sqrt{y^2 + 8}}{y^2 + y - 2}$

Continued on Back  $\Rightarrow$

6. Evaluate the following two limits using

$$g(x) = \begin{cases} e^{2-x} & \text{if } x \leq -3 \\ x+7 & \text{if } x > -3 \end{cases}$$

(a)  $\lim_{x \rightarrow 12} g(x)$

(b)  $\lim_{x \rightarrow -3} g(x)$

7. Evaluate  $\lim_{h \rightarrow 0} \frac{|h|}{h}$ . Hint : Recall the definition of the absolute value function.

### Infinite Limits

8. Evaluate  $\lim_{x \rightarrow 3^-} \frac{9}{(6-2x)^5}$ ,  $\lim_{x \rightarrow 3^+} \frac{9}{(6-2x)^5}$  and  $\lim_{x \rightarrow 3} \frac{9}{(6-2x)^5}$

9. Evaluate  $\lim_{w \rightarrow -9^-} \frac{-2}{(w+9)^{10}}$ ,  $\lim_{w \rightarrow -9^+} \frac{-2}{(w+9)^{10}}$  and  $\lim_{w \rightarrow -9} \frac{-2}{(w+9)^{10}}$