

WebAssign

Assignment #4: Chapter 2.3 (Homework)

Current Score : - / 47 Due : Tuesday, October 13 2015 11:59 PM PDT

1. -/6 pointsSCalcET7 2.3.001.

Given that

$$\lim_{x \rightarrow 2} f(x) = 1 \quad \lim_{x \rightarrow 2} g(x) = -2 \quad \lim_{x \rightarrow 2} h(x) = 0,$$

find the limits, if they exist. (If an answer does not exist, enter DNE.)

(a) $\lim_{x \rightarrow 2} [f(x) + 5g(x)]$

(b) $\lim_{x \rightarrow 2} [g(x)]^3$

(c) $\lim_{x \rightarrow 2} \sqrt{f(x)}$

(d) $\lim_{x \rightarrow 2} \frac{4f(x)}{g(x)}$

(e) $\lim_{x \rightarrow 2} \frac{g(x)}{h(x)}$

(f) $\lim_{x \rightarrow 2} \frac{g(x)h(x)}{f(x)}$

2. -/3 pointsSCalcET7 2.3.007.

Evaluate the limit using the appropriate Limit Law(s). (If an answer does not exist, enter DNE.)

$$\lim_{x \rightarrow 8} \left(1 + \sqrt[3]{x}\right) \left(3 - 5x^2 + x^3\right)$$

3. -/3 pointsSCalcET7 2.3.011.

Evaluate the limit, if it exists. (If an answer does not exist, enter DNE.)

$$\lim_{x \rightarrow 6} \frac{x^2 - 7x + 6}{x - 6}$$

4. -/3 pointsSCalcET7 2.3.020.

Evaluate the limit, if it exists. (If an answer does not exist, enter DNE.)

$$\lim_{t \rightarrow 4} \frac{t^4 - 256}{t^3 - 64}$$

5. -/3 pointsSCalcET7 2.3.029.

Evaluate the limit, if it exists. (If an answer does not exist, enter DNE.)

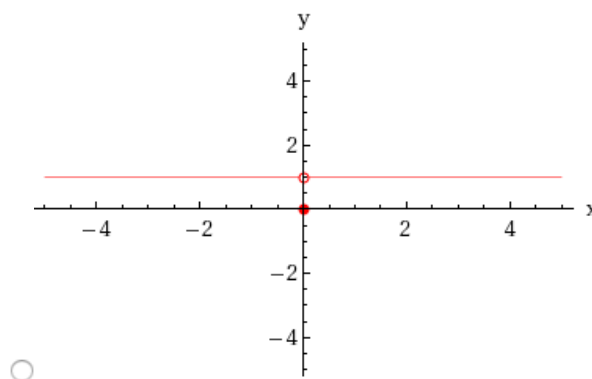
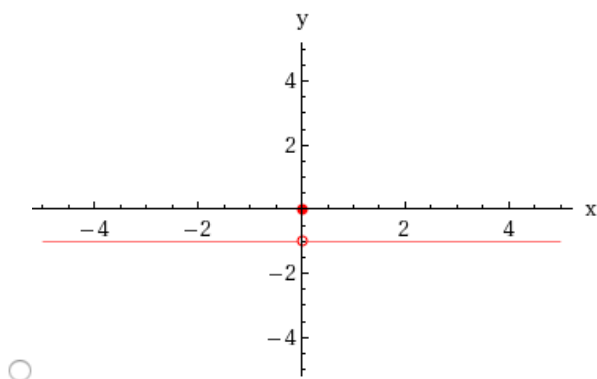
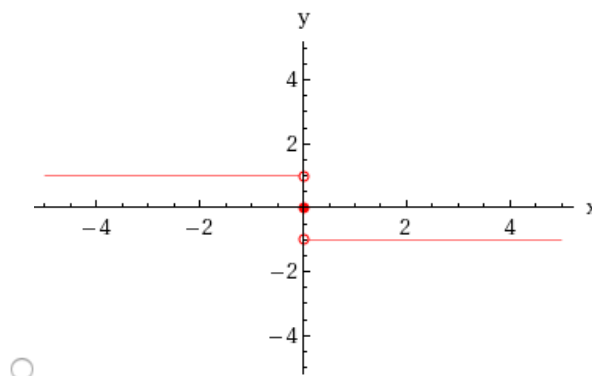
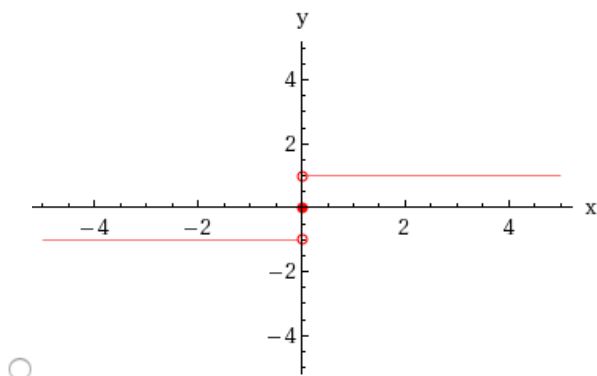
$$\lim_{t \rightarrow 0} \left(\frac{9}{t\sqrt{1+t}} - \frac{9}{t} \right)$$

6. -/5 pointsSCalcET7 2.3.047.

The *signum* (or sign) function, denoted by sgn , is defined by

$$\text{sgn } x = \begin{cases} -1 & \text{if } x < 0 \\ 0 & \text{if } x = 0. \\ 1 & \text{if } x > 0 \end{cases}$$

(a) Sketch the graph of this function.



(b) Find each of the following limits. (If an answer does not exist, enter DNE.)

(i) $\lim_{x \rightarrow 0^+} \text{sgn } x$

(ii) $\lim_{x \rightarrow 0^-} \text{sgn } x$

(iii) $\lim_{x \rightarrow 0} \text{sgn } x$

(iv) $\lim_{x \rightarrow 0} |\text{sgn } x|$

7. -/4 pointsSCalcET7 2.3.048.

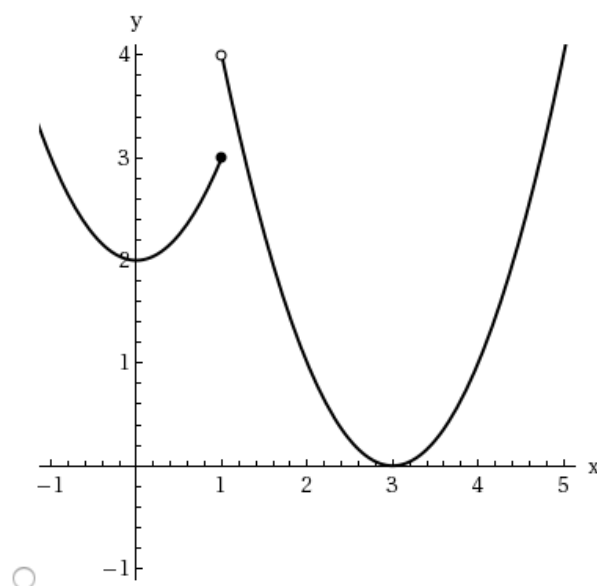
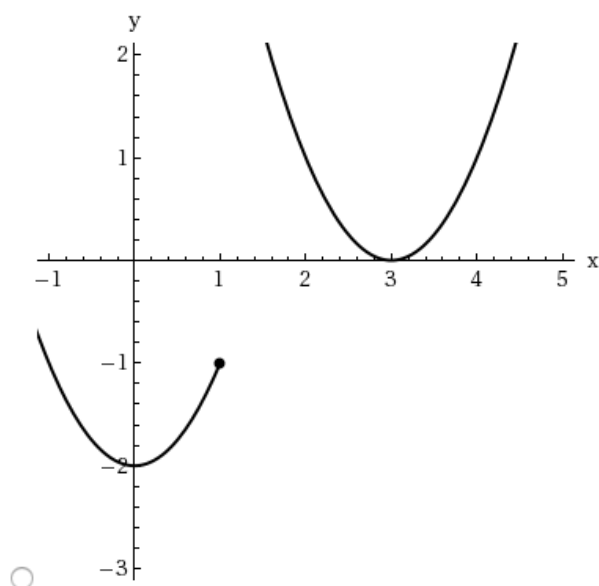
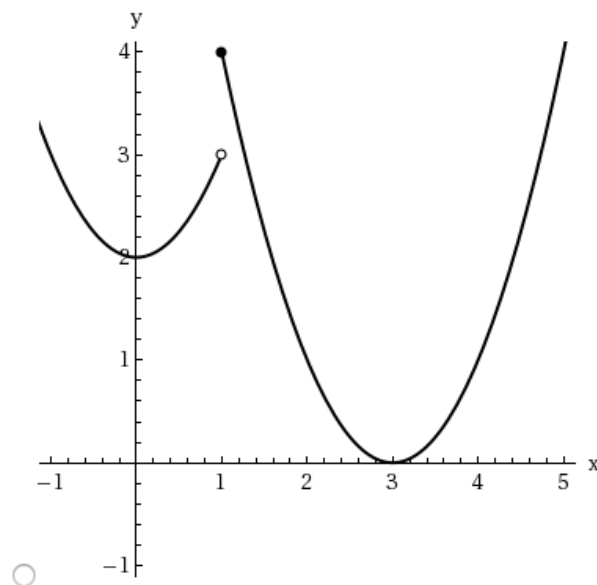
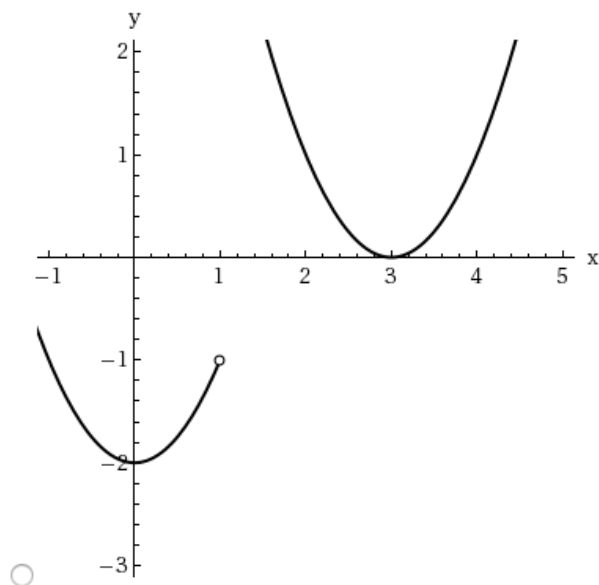
Let

$$f(x) = \begin{cases} x^2 + 2 & \text{if } x < 1 \\ (x - 3)^2 & \text{if } x \geq 1 \end{cases}$$

(a) Find the following limits. (If an answer does not exist, enter DNE.)

$$\lim_{x \rightarrow 1^-} f(x) = \boxed{}$$

$$\lim_{x \rightarrow 1^+} f(x) = \boxed{}$$

(b) Does $\lim_{x \rightarrow 1} f(x)$ exist? Yes No(c) Sketch the graph of f .

8. -/7 pointsSCalcET7 2.3.050.

Let

$$g(x) = \begin{cases} x & \text{if } x < 1 \\ 3 & \text{if } x = 1 \\ 2 - x^2 & \text{if } 1 < x \leq 2 \\ x - 2 & \text{if } x > 2 \end{cases}$$

(a) Evaluate each of the following, if it exists. (If an answer does not exist, enter DNE.)

(i) $\lim_{x \rightarrow 1^-} g(x)$

(ii) $\lim_{x \rightarrow 1^+} g(x)$

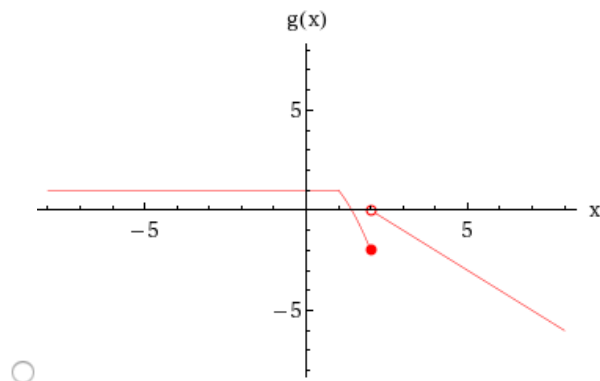
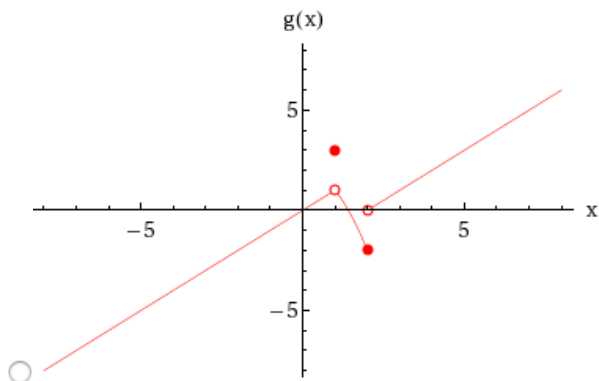
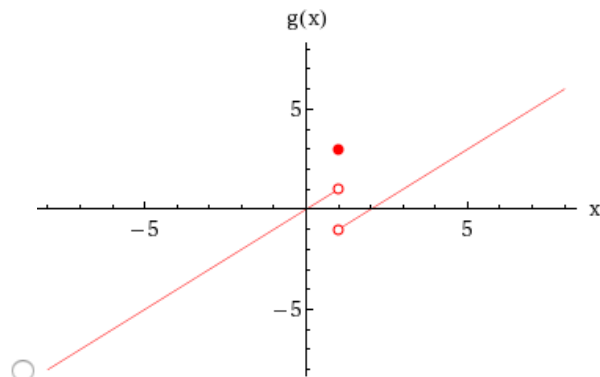
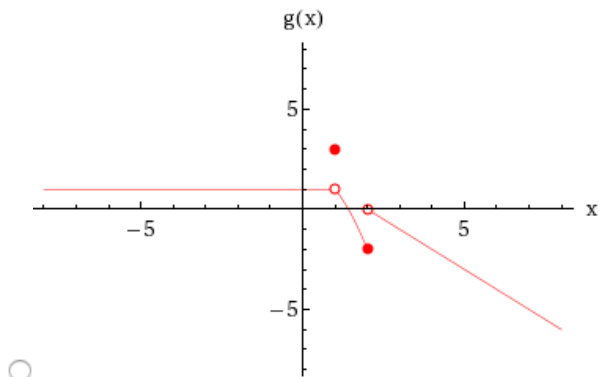
(iii) $g(1)$

(iv) $\lim_{x \rightarrow 2^-} g(x)$

(v) $\lim_{x \rightarrow 2^+} g(x)$

(vi) $\lim_{x \rightarrow 2} g(x)$

(b) Sketch the graph of g .



9. -/3 pointsSCalcET7 2.TF.002.

Determine whether the statement is true or false.

$$\lim_{x \rightarrow 1} \frac{x^2 + 8x - 9}{x^2 + 7x - 8} = \frac{\lim_{x \rightarrow 1} (x^2 + 8x - 9)}{\lim_{x \rightarrow 1} (x^2 + 7x - 8)}$$

- True
 False

10. -/3 pointsSCalcET7 2.TF.003.

Determine whether the statement is true or false.

$$\lim_{x \rightarrow 1} \frac{x - 2}{x^2 + 2x - 4} = \frac{\lim_{x \rightarrow 1} (x - 2)}{\lim_{x \rightarrow 1} (x^2 + 2x - 4)}$$

- True
 False

11. -/3 pointsSCalcET7 2.TF.015.

Determine whether the statement is true or false.

If f is continuous at 5 and $f(5) = 5$ and $f(4) = 3$, then $\lim_{x \rightarrow 2} f(4x^2 - 11) = 5$.

- True
 False

12. -/4 points

Evaluate the limit, if it exists. (If an answer does not exist, enter DNE.)

$$\lim_{x \rightarrow 8} \left(\frac{\sqrt{12-x} - 2}{\sqrt{24-x} - 4} \right)$$