WebAssign
**1.1 Funciones (Homework)**

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Diferencial, section B, Spring 2019
Instructor: Christiaan Ketelaar

**Current Score :** 40 / 40       **Due :** Thursday, February 7, 2019 11:58 PM CST**Last Saved : n/a Saving... ()**

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**The due date for this assignment is past.** Your work can be viewed below, but no changes can be made.

**Important!** Before you view the answer key, decide whether or not you plan to request an extension. Your Instructor may *not* grant you an extension if you have viewed the answer key. Automatic extensions are not granted if you have viewed the answer key.

Request Extension

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**1.** 2/2 points | Previous AnswersSCalc8 1.1.003.

The graph of a function $f$ is given.
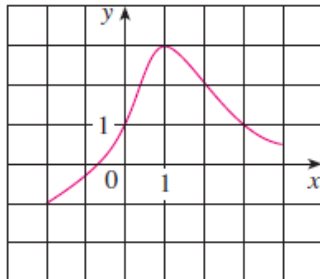


(a) State the value of $f(1)$.

3 ✔

(b) Estimate the value of $f(-1)$.

0 ✔

(c) For what values of $x$ is $f(x) = 1$?  (Enter your answers as a comma-separated list.)

$x =$

$$0,3

✔

(d) Estimate the value of $x$ such that $f(x) = 0$.

$x =$ -1 ✔

(e) State the domain and range of $f$. (Enter your answers in interval notation.)
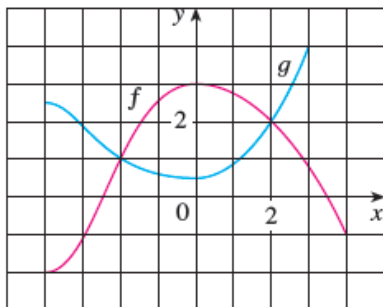
$$[−2,4]

domain

✔

$$[−1,3]

range

✔

(f) On what interval is $f$ increasing? (Enter your answer using interval notation.)

$$[−2,1]

✔

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**2.** 2/2 points | Previous AnswersSCalc8 1.1.004.

The graphs of *f* and *g* are given.



(a) State the values of $f(-3)$ and $g(2)$.

$f(-3)$ = [ -1 ] ✔

$g(2)$ = [ 2 ] ✔

(b) For what values of *x* is $f(x) = g(x)$? (Enter your answers as a comma-separated list.)

x =

$$-2,2

[                    ]

✔

(c) Estimate the solutions of the equation $f(x) = -1$. (Enter your answers as a comma-separated list.)

x =

$$-3,4

[                    ]

✔

(d) On what interval is *f* decreasing? (Enter your answer using interval notation.)

$$[0,4]

[                    ]

✔

(e) State the domain and range of *f*. (Enter your answers in interval notation.)

$$[-4,4]

domain      [                    ]

✔

$$[-2,3]

range       [                    ]

✔

(f) State the domain and range of *g*. (Enter your answers in interval notation.)
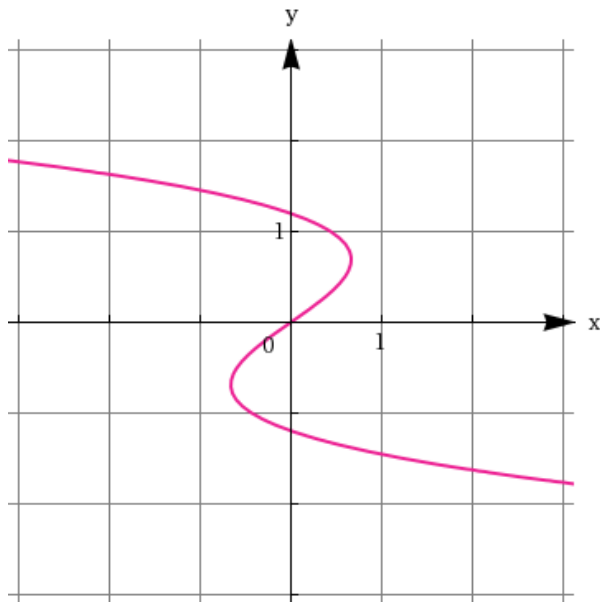
$$[-4,3]

domain      [                    ]

✔

range       $$[12,4]

[                    ]

✔

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**3.** 2/2 points | Previous AnswersSCalc8 1.1.007.

Consider the following graph.



Determine whether the curve is the graph of a function of $x$.

○ Yes, it is a function.

◉ No, it is not a function.

✔

If it is, state the domain and range of the function. (Enter your answers in interval notation. If the curve is not the graph of a function of $x$, enter DNE.)
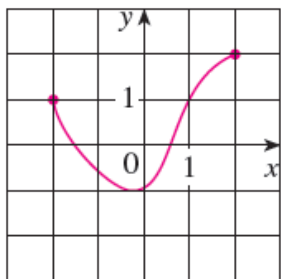
$$DNE

domain  [        ]

✔

$$DNE

range  [        ]

✔

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**4.** 2/2 points | Previous AnswersSCalc8 1.1.008.

Consider the following graph.



Determine whether the curve is the graph of a function of *x*.

◉  Yes, it is a function.

◯  No, it is not a function.

✔

If it is, state the domain and range of the function. (Enter your answers using interval notation. If it is not a function, enter DNE in all blanks.)
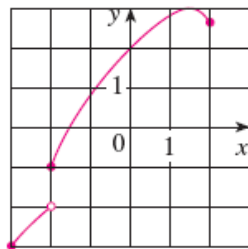
$$[-2,2]$$

domain  [                    ]

✔

$$[-1,2]$$

range  [                    ]

✔

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**5.** 2/2 points | [Previous Answers]SCalc8 1.1.009.

Consider the following graph.



Determine whether the curve is the graph of a function of *x*.

◉ Yes, it is a function.

○ No, it is not a function.

✔

If it is, state the domain and range of the function. (Enter your answers using interval notation. If it is not a function, enter DNE in all blanks.)
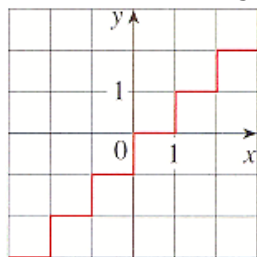
$$[-3,2]$$

domain  [                    ]

✔

$$[-3,-2)\cup[-1,3]$$

range  [                    ]

✔

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**6.** 2/2 points | Previous AnswersSCalc8 1.1.010.

Consider the following graph.



Determine whether the curve is the graph of a function of *x*.

○  Yes, it is a function.

◉  No, it is not a function.

         ✔

If it is, state the domain and range of the function. (Enter your answers using interval notation. If it is not a function, enter DNE in all blanks.)

       $$DNE

domain   [                    ]

     ✔

       $$DNE

range   [                    ]

     ✔

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**7.** 2/2 points | Previous AnswersSCalc8 1.1.025.

If $f(x) = 5x^2 - x + 2$, find the following.

$f(3) = \boxed{44}$ ✔

$f(-3) = \boxed{50}$ ✔

$$5a2-a+2$$

$f(a) = $ [                    ]

✔

$$5a2+a+2$$

$f(-a) = $ [                    ]

✔

$$5(a+1)2-(a+1)+2$$

$f(a + 1) = $ [                    ]

✔

$$10a2-2a+4$$

$2f(a) = $ [                    ]

✔

$$20a2-2a+2$$

$f(2a) = $ [                    ]

✔

$$5a4-a2+2$$

$f(a^2) = $ [                    ]

✔

$$25a4-10a3+21a2-4a+4$$

$[f(a)]^2 = $ [                    ]

✔

$$5(a+h)2-(a+h)+2$$

$f(a + h) = $ [                    ]

✔

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**8.** 2/2 points | Previous AnswersSCalc8 1.1.027.

Evaluate the difference quotient for the given function. Simplify your answer.

$$f(x) = 1 + 4x - x^2, \quad \frac{f(4 + h) - f(4)}{h}$$

$$-h-4$$

[                    ]

✔

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**9.** 2/2 points | <u>Previous Answers</u>SCalc8 1.1.028.MI.

Evaluate the difference quotient for the given function. Simplify your answer.

$$f(x) = -x^3, \quad \frac{f(a + h) - f(a)}{h}$$

$$-3a2-3ah-h2$$

✔

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**10.** 2/2 points | <u>Previous Answers</u>SCalc8 1.1.028.MI.SA.

*This question has several parts that must be completed sequentially. If you skip a part of the question, you will not receive any points for the skipped part, and you will not be able to come back to the skipped part.*

**Tutorial Exercise**

Evaluate the difference quotient for the given function. Simplify your answer.

$$f(x) = x^3, \quad \frac{f(a + h) - f(a)}{h}$$

**Step 1**

For any function $y = f(x)$, the difference quotient is defined as $\frac{f(a + h) - f(a)}{h}$.

Our function is $f(x) = x^3$. Therefore,

$f(a) =$
$$a3$$

☐

✔ .

**Step 2**

Similarly,

$$f(a + h) = \left( \begin{array}{c} a+h \\ \boxed{\phantom{xxxxx}} \end{array} \vphantom{\Big)} ✔ \right)^3$$

$$= (a + h)(a + h)(a + h)$$

$$= a^3 + \boxed{3} ✔ \; a^2h + 3ah^2 + h^{\boxed{3}} ✔ \; .$$

**Step 3**

Substituting these into the difference quotient, we have

$$\frac{f(a + h) - f(a)}{h} = \frac{(a + h)^3 - a^3}{h}$$

$$= \frac{\left( a^3 + 3a^2h + 3ah^2 + h^3 \right) - a^3}{\boxed{h}}$$ ✔ .

**Step 4**

Subtracting $a^3$ and canceling $h$ from the numerator and denominator gives us the final answer. (Simplify your answer completely.)

$$\frac{f(a + h) - f(a)}{h} =$$
$$3a2+h2+3ah$$

☐

✔

You have now completed the Master It.

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**11.** 2/2 points | <u>Previous Answers</u>SCalc8 1.1.029.

Evaluate the difference quotient for the given function. Simplify your answer.

$$f(x) = \frac{1}{x}, \qquad \frac{f(x) - f(a)}{x - a}$$

$$-\frac{1}{xa}$$

✔

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**12.** 2/2 points | <u>Previous Answers</u>SCalc8 1.1.032.

Find the domain of the function. (Enter your answer using interval notation.)

$$f(x) = \frac{2x^3 - 5}{x^2 + 2x - 3}$$

$$(-\infty, -3) \cup (-3, 1) \cup (1, \infty)$$

✔

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**13.** 2/2 points | <u>Previous Answers</u>SCalc8 1.1.033.

Find the domain of the function. (Enter your answer using interval notation.)

$$f(t) = \sqrt[3]{6t - 5}$$

$$(-\infty, \infty)$$

✔

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**14.** 2/2 points | Previous AnswersSCalc8 1.1.038.

Find the domain and range of the function. (Enter your answers using interval notation.)
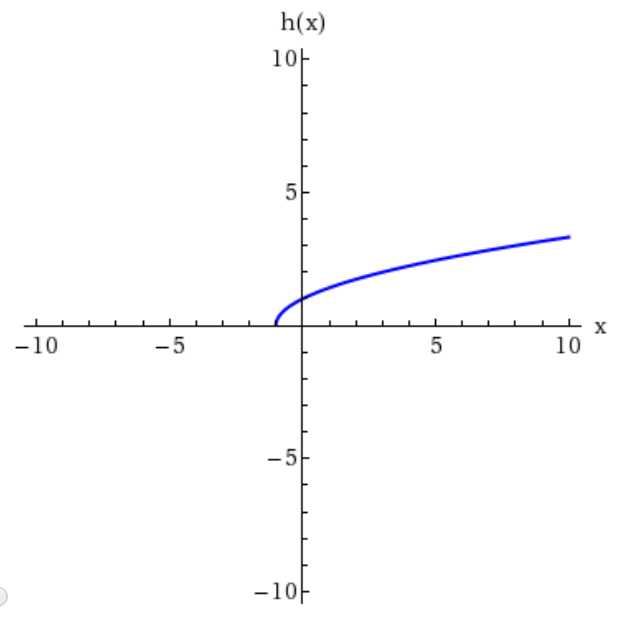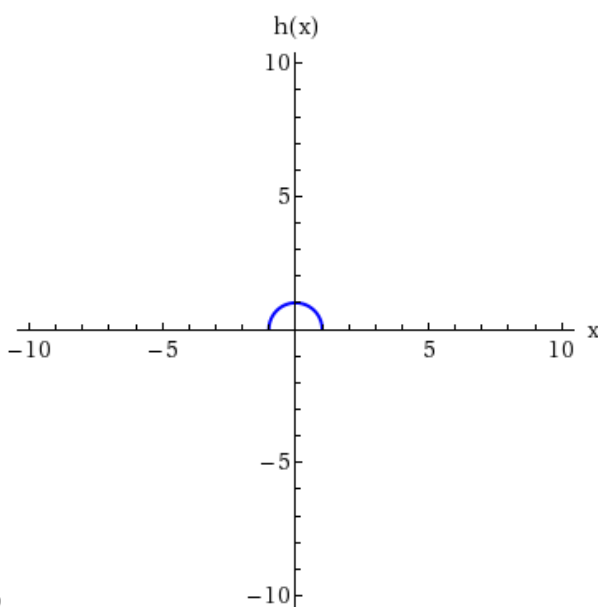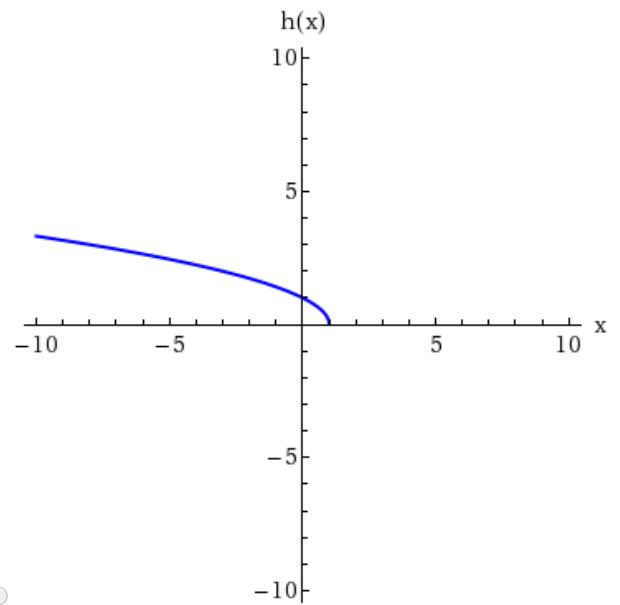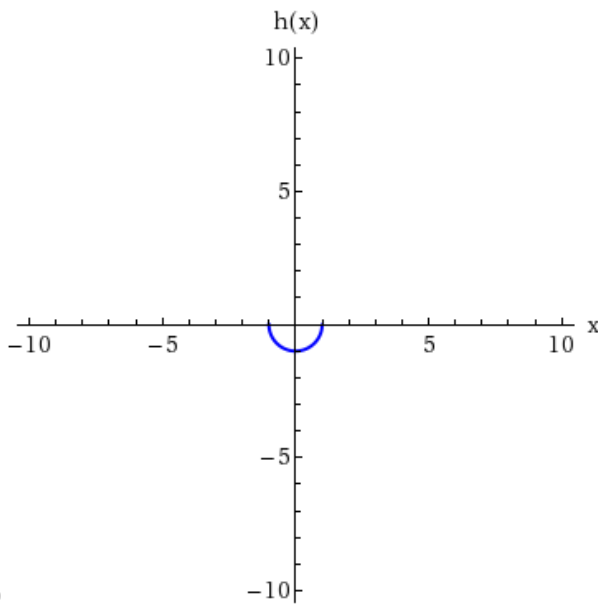
$$h(x) = \sqrt{1 - x^2}$$

$$[-1,1]$$

domain

✔

$$[0,1]$$

range

✔

Sketch the graph of the function.

h(x) graphs:

○ (first graph — top left)

○ (second graph — top right)

◉ (third graph — bottom left)

✔ (fourth graph — bottom right)

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**15.** 2/2 points | [Previous Answers](#)SCalc8 1.1.041.

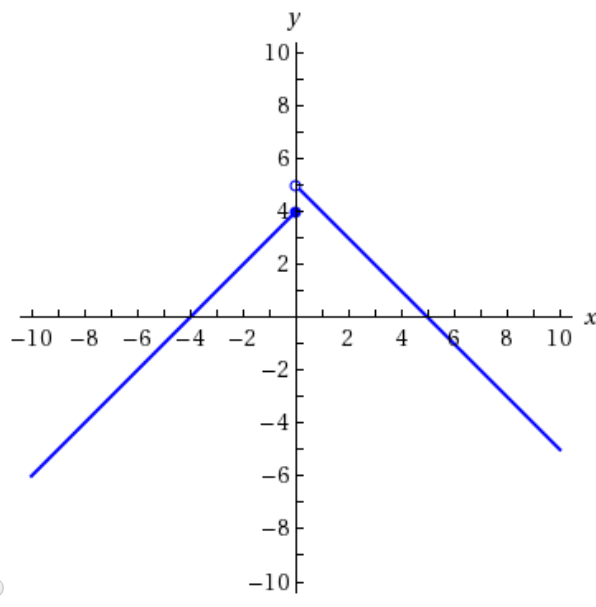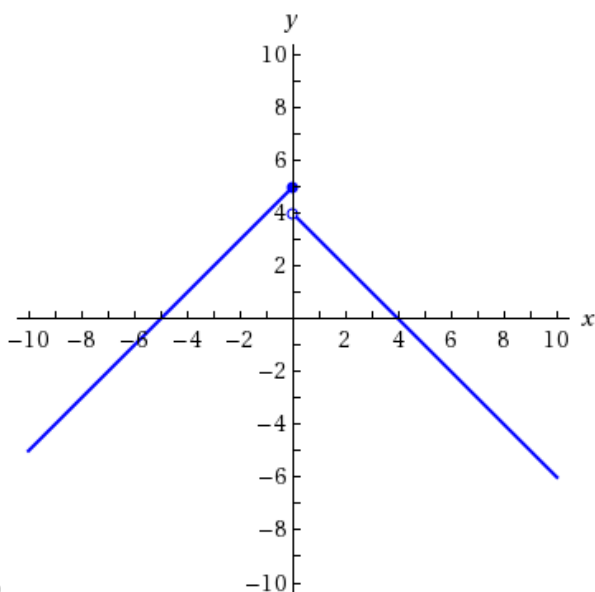Evaluate $f(-7)$, $f(0)$, and $f(5)$ for the piecewise defined function.
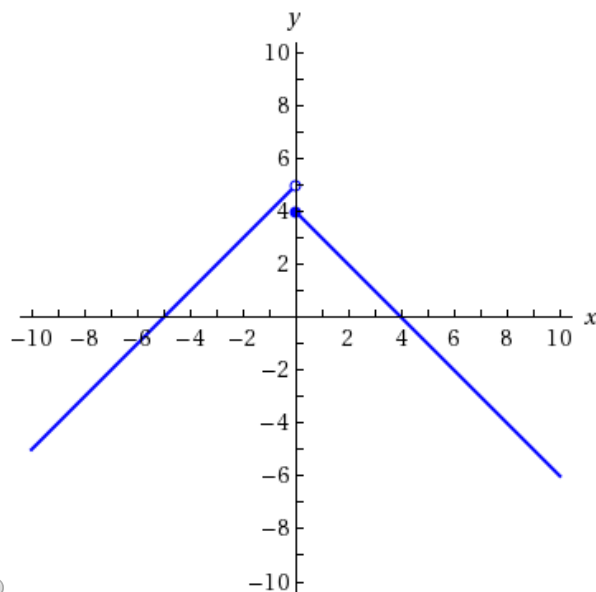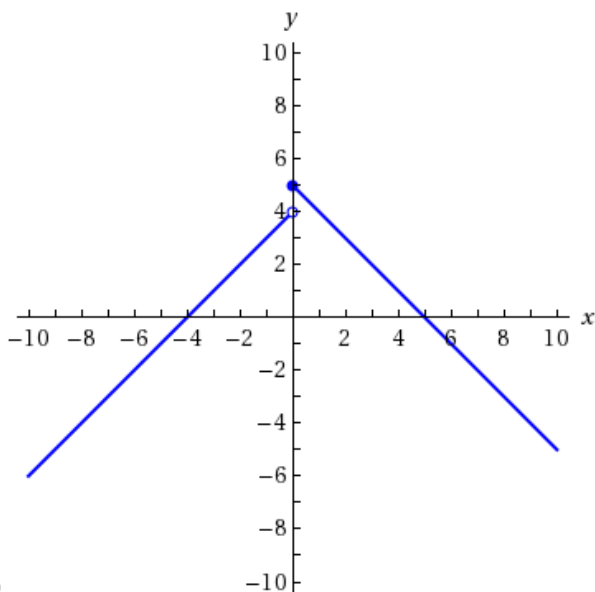
$$f(x) = \begin{cases} x + 5 & \text{if } x < 0 \\ 4 - x & \text{if } x \geq 0 \end{cases}$$

$f(-7) = \boxed{-2}$ ✔

$f(0) = \boxed{4}$ ✔

$f(5) = \boxed{-1}$ ✔

Sketch the graph of the function.

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**16.** 2/2 points | Previous AnswersSCalc8 1.1.051.

Find an expression for the function whose graph is the given curve. (Assume that the points are in the form $(x, f(x))$.)

The line segment joining the points  $(1, -2)$, and $(5, 8)$

$f(x) =$

$$52x-92$$

[ text box ]

✔

Find the domain of the function. (Enter your answer using interval notation.)

$$[1,5]$$

[ text box ]

✔

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**17.** 2/2 points | Previous AnswersSCalc8 1.1.057.

Find a formula for the described function.

A rectangle has perimeter 20 m. Express the area $A$ of the rectangle as a function of the length, $L$, of one of its sides.
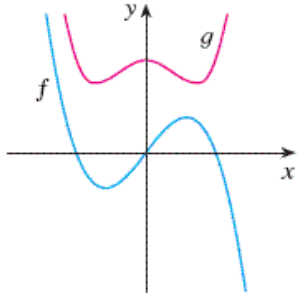
$A =$

$$10L-L2$$

[ text box ]

✔  $m^2$

State the domain of $A$. (Assume the length of the rectangle is longer than its width. Enter your answer in interval notation.)

$$(5,10)$$

[ text box ]

✔

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**18.** 2/2 points |  [Previous Answers](#)SCalc8 1.1.069.

Graphs of *f* and *g* are shown.



Is *f* even, odd, or neither?

- ○ even
- ◉ odd
- ○ neither

✔

Explain your reasoning.

- ◉ It is symmetric about the origin.
- ○ It is symmetric with respect to the *y*-axis.
- ○ It is symmetric with respect to the *x*-axis.
- ○ It is not symmetric about the origin or the *y*-axis.

✔

Is *g* even, odd, or neither?

- ◉ even
- ○ odd
- ○ neither

✔

Explain your reasoning.

- ○ It is symmetric about the origin.
- ◉ It is symmetric with respect to the *y*-axis.
- ○ It is symmetric with respect to the *x*-axis.
- ○ It is not symmetric about the origin or the *y*-axis.

✔

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**19.** 2/2 points | Previous AnswersSCalc8 1.1.073.

Determine whether *f* is even, odd, or neither. If you have a graphing calculator, use it to check your answer visually.

$$f(x) = \frac{x}{x^2 + 3}$$

○  even

◉  odd

○  neither

✔

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**20.** 2/2 points | Previous AnswersSCalc8 1.1.074.

Determine whether *f* is even, odd, or neither. If you have a graphing calculator, use it to check your answer visually.

$$f(x) = \frac{x^2}{x^4 + 5}$$

◉  even

○  odd

○  neither

✔