

WeBWork Assignment Homework01 is due : 04/28/2016 at 05:32pm EDT.

Reference: Axler, Precalculus, 2nd ed, Sections 0.3, 1.1, and 1.2

Here's the list of **functions and symbols** that WeBWork understands.

1. (1 pt) Solve the following equation.

$$|-3x+7|+4=11$$

Answer: _____

Note: If there is more than one answer, write them separated by commas (e.g., 1, 2).

2. (1 pt) Solve the following equation.

$$\frac{1}{|11-7x|}=4$$

Answer: _____

Note: If there is more than one answer, write them separated by commas (e.g., 1, 2).

3. (1 pt) Solve the following equation.

$$|2x+9|=|9x+10|$$

Answer: _____

Note: If there is more than one answer, write them separated by commas (e.g., 1, 2).

4. (1 pt) Express each union below as a single interval.

$$[5, 9) \cup (7, 10] = \underline{\hspace{2cm}}$$

$$[1, 11) \cup (5, 9] = \underline{\hspace{2cm}}$$

$$[0, 2) \cup (-1, 4] = \underline{\hspace{2cm}}$$

$$(-\infty, -4] \cup (-\infty, -3) = \underline{\hspace{2cm}}$$

5. (1 pt) Express each intersection below in interval notation.

If the intersection is empty, enter $\{\}$ for the empty set.

$$[0, 4) \cap (2, 6] = \underline{\hspace{2cm}}$$

$$[2, 12) \cap (6, 9] = \underline{\hspace{2cm}}$$

$$[4, 6) \cap (3, 7] = \underline{\hspace{2cm}}$$

$$(-\infty, -9] \cap (-\infty, -7) = \underline{\hspace{2cm}}$$

6. (1 pt) Match the statements in the lefthand column with their equivalent statements in the righthand column.

- ___ 1. $|x-2| \leq 8$
- ___ 2. $|x-2| > 8$
- ___ 3. $|x-2| = 8$
- ___ 4. $|x-2| \geq 8$
- ___ 5. $|x-2| < \infty$

- A. $x \in (-\infty, \infty)$
- B. $x \in (-\infty, -6) \cup (10, \infty)$
- C. $x \in \{-6, 10\}$
- D. $x \in [-6, 10]$
- E. $x \in (-\infty, -6] \cup [10, \infty)$

7. (1 pt) Solve the following inequality. Write the answer in interval notation. If the answer includes more than one interval write the intervals separated by the "union" symbol, U. If needed enter ∞ as "infinity".

$$8|1x+2|+8 \leq 24$$

Answer: _____

8. (1 pt) Solve the following inequality. Write the answer in interval notation.

Note: If the answer includes more than one interval write the intervals separated by the "union" symbol, U. If needed enter ∞ as *infinity* and $-\infty$ as *-infinity*.

$$|x-7| > 5$$

Answer: _____

9. (1 pt) Solve the following inequality. Enter the answer in interval notation.

$$|2x-5| < 10$$

Answer: _____

10. (1 pt) Solve the following inequality. Write the answer in interval notation. **Note:** If the answer includes more than one interval write the intervals separated by the "union" symbol, U. If needed enter ∞ as *infinity* and $-\infty$ as *-infinity*.

$$\frac{x-2}{x-5} \leq -7$$

Answer: _____

11. (1 pt) Suppose $f(x) = 2x + 1$.

(a) Find, simplifying your answer as possible: $f(0) =$ _____

(b) Solve $f(x) = 0$, simplifying your answer as possible: $x =$ _____

12. (1 pt) Suppose $f(x) = 3 + 5x^2$.

(a) Simplify as much as possible: $f\left(\frac{1}{3}\right) =$ _____

(b) Simplify as much as possible: $\frac{f(1)}{f(3)} =$ _____

(c) Are $f\left(\frac{1}{3}\right)$ and $\frac{f(1)}{f(3)}$ equal?

13. (1 pt) Suppose $f(x) = \sqrt{32 + 2x^2}$.

(a) Calculate exactly the value of y when $y = f(6)$. Simplify your answer as much as possible.

$y =$ _____

(b) Calculate the exactly the value of x when $f(x) = 8$. Simplify your answer as much as possible.

$x =$ _____

14. (1 pt) A national park records data regarding the total fox population F over a 12 month period, where $t = 0$ means January 1, $t = 1$ means February 1, and so on. Below is the table of values they recorded:

t, month	0	1	2	3	4	5	6	7	8	9	10
F, foxes	150	143	125	100	75	57	50	57	75	100	125

(a) Is F a function of t

- A. Yes
- B. No

(b) Let $g(t) = F$ denote the fox population in month t . Find all solution(s) to the equation $g(t) = 125$. If there is more than one solution, give your answer as a comma separated list of numbers.

$t =$ _____

15. (1 pt) Let $q(x) = 4 - x^2$. Evaluate and simplify the following:

- (a) $q(3) =$ _____
 (b) $q(r) =$ _____
 (c) $q(r - 3) =$ _____
 (d) $q(r) - 3 =$ _____
 (e) $q(r) - q(3) =$ _____

16. (1 pt) Find the domain and range of the function $y = f(x) = \sqrt{x - 5}$. Your answers must be inequalities (not intervals).

Domain: _____

Range: _____

17. (1 pt) Find the domain and range of the function $y = f(x) = \sqrt{x^2 - 9}$ algebraically.

Domain: _____

Range: _____

18. (1 pt) Find the domain and range of the function $y = f(x) = (x - 5)^2 + 3$.

Domain: _____

Range: _____

19. (1 pt) Let $f(x) = \frac{1}{\sqrt{x-3}}$.

Find the domain and range algebraically:

- a) What is the domain of $f(x)$? _____
 b) What is the range of $f(x)$? _____

20. (1 pt) Fill in all of the blanks in the table below for which you have sufficient information. If you do not have enough information to fill in a blank, type **NONE** in the blank space provided. Do not leave any blanks empty.

x	-3	-2	-1	0	1	2	3
$f(x)$	2	-6	3	0	-3	-1	-4
$f(-x)$	___	___	___	___	___	___	___
$-f(x)$	___	___	___	___	___	___	___
$\frac{f(x)}{-2}$	___	___	___	___	___	___	___
$\frac{f(x)}{-2} - 2$	___	___	___	___	___	___	___
$f(x) + 2$	___	___	___	___	___	___	___
$f(x + 2)$	___	___	___	___	___	___	___
$2f(x)$	___	___	___	___	___	___	___
$-f(x)/3$	___	___	___	___	___	___	___

21. (1 pt) Let $y = f(x)$ be the piecewise defined function given below.

$$f(x) = \begin{cases} -x - 1, & \text{if } x \leq -2, \\ 1, & \text{if } -2 < x < 2, \\ x - 1, & \text{if } x \geq 2. \end{cases}$$

a. $f(-3) =$ _____

b. $f(2) =$ _____

c. For what values of x is $f(x) = 1$?

d. Find the domain and range of f . (You may find it helpful to graph this function on your own paper to find the domain and range.) Your answers must be inequalities (not intervals).

Domain: _____

Range: _____

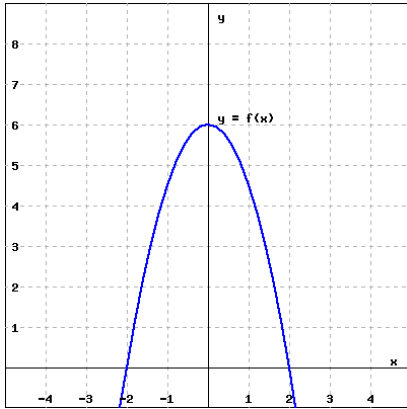
22. (1 pt)

The graph of $y = f(x)$ is given in the figure.

(a) $f(0) =$ _____

(b) For what x -value(s) is $f(x) = 0$? _____

(c) For what x -value(s) is $f(x) > 0$? _____

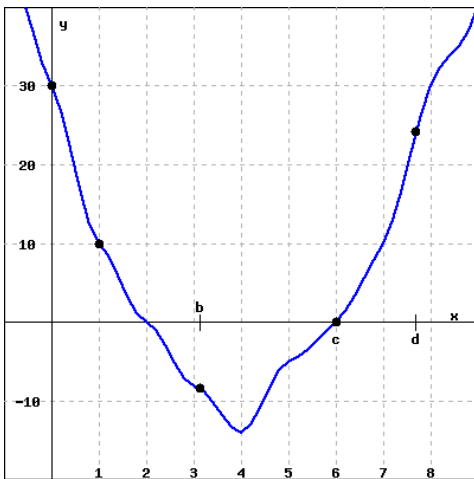


(Click on graph to enlarge)

23. (1 pt)

Use the graph of $y = f(x)$ in the figure to estimate:

- $f(0) \approx$ _____
- $f(1) \approx$ _____
- $f(b) \approx$ _____
- $f(c) \approx$ _____
- $f(d) \approx$ _____



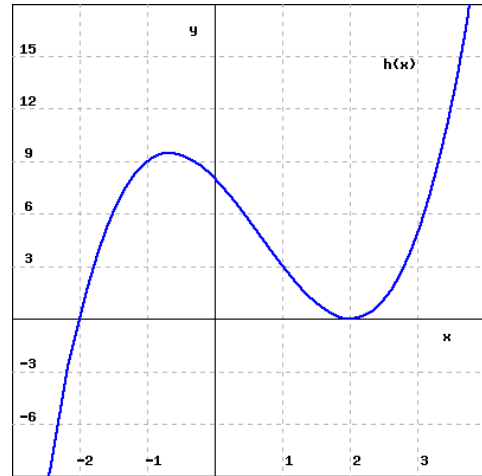
(Click on graph to enlarge)

24. (1 pt)

Using the graph in the figure for the function $y = h(x)$, fill in the missing values in the table below.

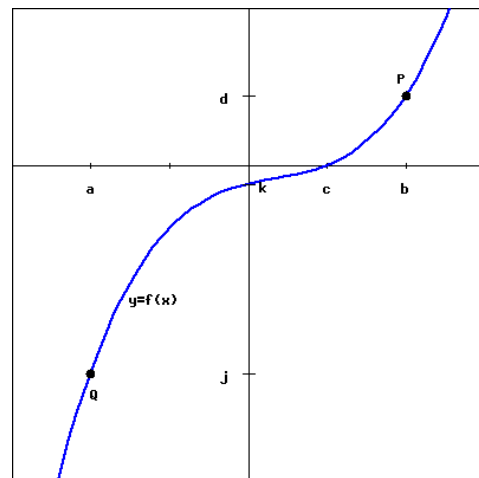
x	-2	-1	0	1	2	3
h(x)	___	___	___	___	___	___

- (a) Evaluate $h(0) - h(-2) =$ _____
- (b) Evaluate $h(3) - h(1) =$ _____
- (c) Evaluate $3 \cdot h(2) =$ _____
- (d) Evaluate $h(1) + 6 =$ _____



(Click on graph to enlarge)

25. (1 pt) Use the letters $a, b, c, d, j,$ and k labeled in the graph below to answer the following questions.



(click on image to enlarge)

- (a) What are the coordinates of the point P ?
 $P =$ _____
- (b) What are the coordinates of the point Q ?
 $Q =$ _____

(c) Evaluate:

$f(c) = \underline{\hspace{2cm}}$

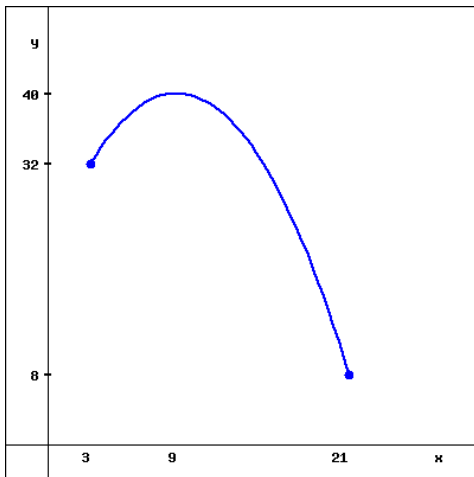
(d) Suppose $k = f(z)$ and $z = f(x)$: then
 $x = \underline{\hspace{2cm}}$

26. (1 pt)

Estimate the domain and range of the function $y = f(x)$ graphed in the figure. Assume the entire graph is shown.

(a) What is the domain of $f(x)$? $\underline{\hspace{2cm}}$

(b) What is the range of $f(x)$? $\underline{\hspace{2cm}}$



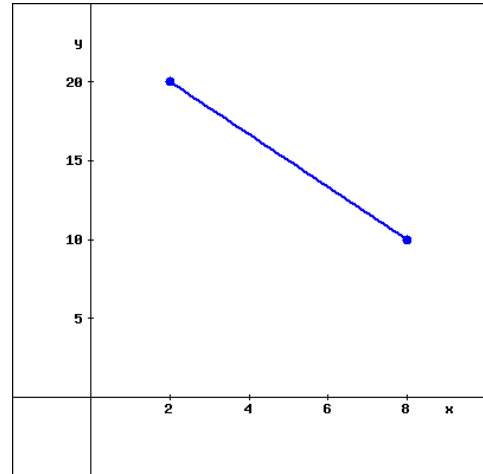
(Click graph to enlarge)

27. (1 pt)

Estimate the domain and range of the function $y = f(x)$ graphed to the right. Assume the entire graph is shown.

(a) What is the domain of $f(x)$? $\underline{\hspace{2cm}}$

(b) What is the range of $f(x)$? $\underline{\hspace{2cm}}$



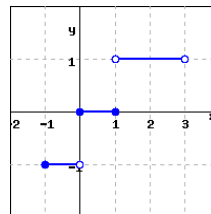
(Click graph to enlarge)

28. (1 pt) Graph the piecewise defined function below. Use an open circle to represent a point which is not included and a solid dot to indicate a point which is on the graph.

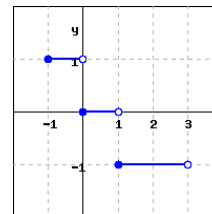
$$f(x) = \begin{cases} 1 & -1 \leq x < 0 \\ 0 & 0 \leq x \leq 1 \\ -1 & 1 < x < 3 \end{cases}$$

After you have graphed the function on a separate piece of paper, indicate which of the graphs below matches the graph you sketched. Be sure to pay attention to whether endpoints are open or closed.

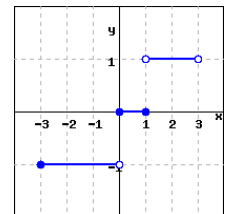
Choose the letter A-E of the correct graph .



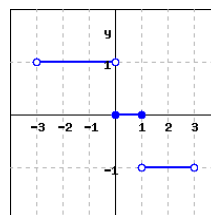
A



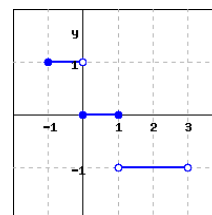
B



C



D



E