Precalculus (23554) (Math 1) HW Set #5. Due in class on Wednesday, March 11th.

In order to receive a ✓ , you must attempt all problems and write out all steps leading to your answers neatly and legibly. You cannot simply write the correct answer to demonstrate your mathematical understanding.

You must include your name, the course title and section number on the first page. All homework sets must be stapled. No late homework will be accepted without my express permission. You may receive a ✗ if these guidelines are not followed.

Good luck!

The graph of a function is given. Determine whether the function is increasing, decreasing, or constant on the given interval.
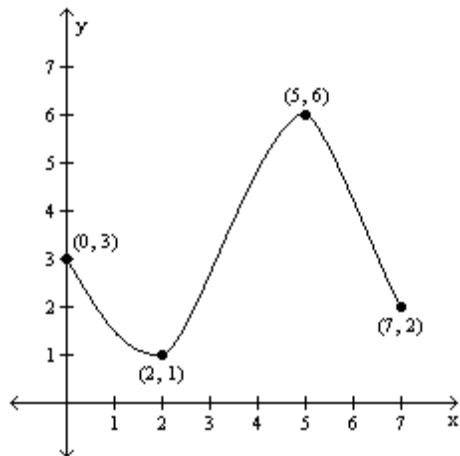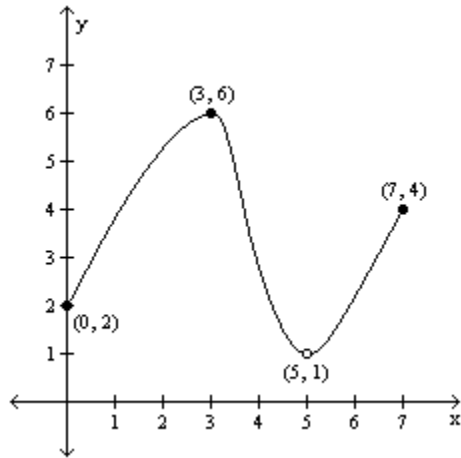
1) (–3, 0)

1) _____
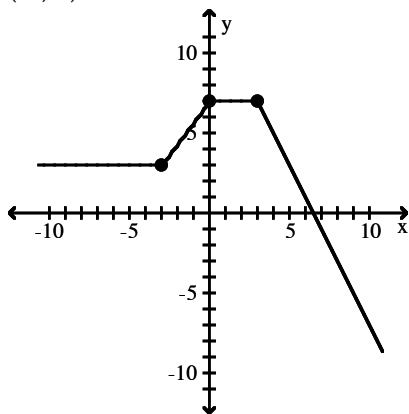
For the graph of the function y = f(x), find the absolute maximum and the absolute minimum, if it exists.
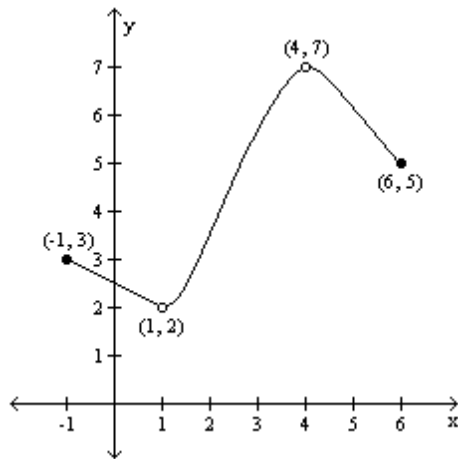
2)

2) _____

3)

4)

Find the average rate of change for the function between the given values.

5) $f(x) = x^2 + 9x$; from 3 to 5

5) _____

6) $f(x) = \sqrt{2x}$; from 2 to 8

6) _____

At the given point, simplify the difference quotient $\dfrac{f(x + h) - f(x)}{h}$ **in such a way that it is safe to plug in the value 0**

for h. What do you get if you put h = 0 into the simplified difference quotient?

7) $y = 6x + 4$, $x = 2$

7) _____

8) $y = x^2 + 5x$, $x = 4$

8) _____

9) $y = x^2 + 5x + 3$, $x = 1$

9) _____

2

Graph the function.

10)
$$f(x) = \begin{cases} x+2 & \text{if } -7 \le x < 3 \\ -9 & \text{if } x = 3 \\ -x+5 & \text{if } x > 3 \end{cases}$$

10) _____

11)
$$f(x) = \begin{cases} 1 & \text{if } -2 \le x < 6 \\ |x| & \text{if } 6 \le x < 8 \\ \sqrt{x} & \text{if } 8 \le x \le 12 \end{cases}$$

11) _____

Graph the function by starting with the graph of the basic function and then using the techniques of shifting, compressing, stretching, and/or reflecting.

12) $f(x) = \sqrt{x+6} + 4$

12) _____

13) $f(x) = x^2 + 12x + 37$

13) _____

Find the vertical asymptotes of the rational function.

14) $h(x) = \dfrac{9x}{x+4}$

14) _____

15) $f(x) = \dfrac{x+7}{x^2 - 64}$

15) _____

Give the equation of the horizontal asymptote, if any, of the function.

16) $h(x) = \dfrac{8x-6}{x-2}$

16) _____

17) $h(x) = \dfrac{6x^2 - 2x - 8}{2x^2 - 9x + 6}$

17) _____

18) $f(x) = \dfrac{x+3}{x^2 - 25}$

18) _____

For the given functions f and g, find the requested function or functional value.

19) $f(x) = 8x^2 - 5x, \quad g(x) = x^2 - 2x - 15$

Find $\dfrac{f}{g}$.

19) _____

20) $f(x) = 9 - 2x, \quad g(x) = -5x + 2$

Find $f + g$.

20) _____

1) increasing
2) Absolute maximum: f(5) = 6; Absolute minimum: f(2) = 1
3) Absolute maximum: f(3) = 6; Absolute minimum: none
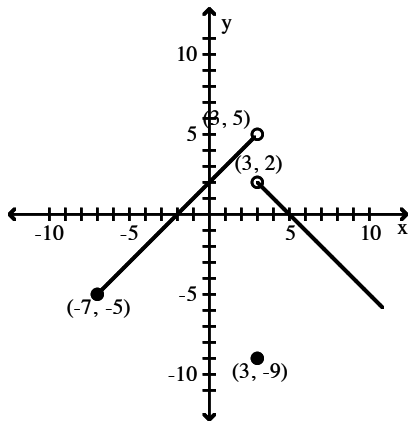4) Absolute maximum: none; Absolute minimum: none
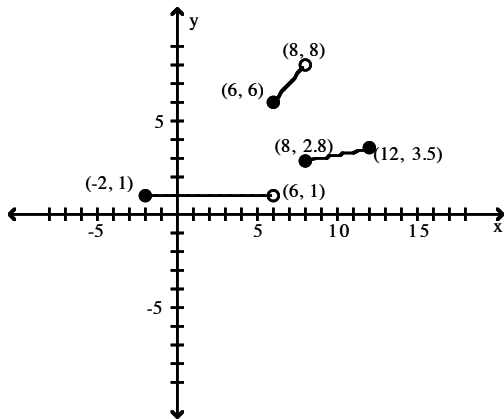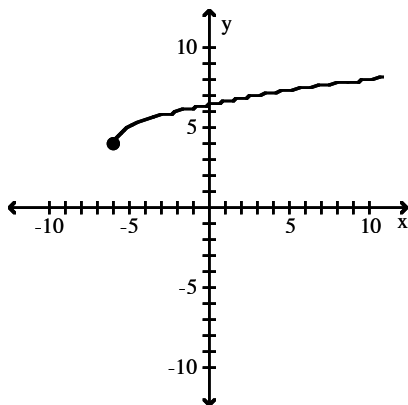5) 17
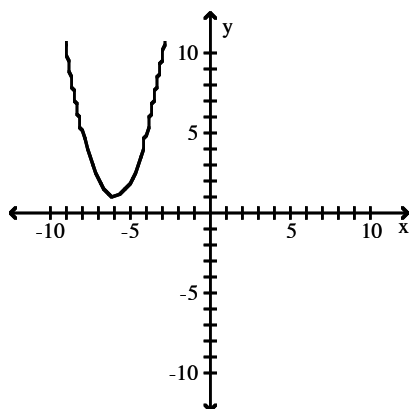
6) $\dfrac{1}{3}$

7) m = 6
8) m = 13
9) m = 7
10)

11)

12)

13)

14) $x = -4$
15) $x = -8$, $x = 8$
16) $y = 8$
17) $y = 3$
18) $y = 0$

19) $\dfrac{8x^2 - 5x}{x^2 - 2x - 15}$

20) $-7x + 11$