Precalculus (Math 1) HW Set #5.

Answers must be submitted on Moodle by 1:30 PM on Wednesday, March 22nd. Do NOT begin the Moodle quiz until you have completed all problems you wish to submit for credit. Moodle will only give you one opportunity to submit your answers. It will also time you out if you leave the quiz open for too long.

Good luck!

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

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

1) \( f(x) = (x + 6)^2 + 1 \)
2) \( f(x) = \sqrt{x + 6} + 4 \)

A)

B)

C)

D)

3) \( f(x) = |x + 3| - 5 \)
4) \[ f(x) = \frac{1}{x + 2} - 4 \]
5) \( f(x) = 2(x + 1)^2 - 2 \)
Use transformations of the graph of $y = x^4$ or $y = x^5$ to graph the function.

6) $f(x) = -2(x + 5)^4 + 3$
7) $f(x) = (x + 4)^5 + 2$
The graph of a function is given. Determine whether the function is increasing, decreasing, or constant on the given interval.

8) \((-2, -1)\)

A) constant  B) decreasing  C) increasing
9) \((-2, 0)\)
A) decreasing  B) constant  C) increasing

10) \((3, \infty)\)
A) increasing  B) decreasing  C) constant

11) \((2.2, 5)\)
A) constant  B) decreasing  C) increasing
Use the graph to find the intervals on which it is increasing, decreasing, or constant.

12) 

- A) Decreasing on \((-\pi, -\frac{\pi}{2})\) and \(\left(\frac{\pi}{2}, \pi\right)\); increasing on \(\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)\)
- B) Increasing on \((-\infty, \infty)\)
- C) Increasing on \((-\pi, -\frac{\pi}{2})\) and \(\left(\frac{\pi}{2}, \pi\right)\); decreasing on \(\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)\)
- D) Decreasing on \((-\pi, 0)\); increasing on \((0, \pi)\)

13) 

- A) Decreasing on \((-3, -2)\) and \((2, 4)\); increasing on \((-1, 1)\)
- B) Decreasing on \((-3, -2)\) and \((2, 4)\); increasing on \((-1, 1)\); constant on \((-2, -1)\) and \((1, 2)\)
- C) Decreasing on \((-3, -1)\) and \((1, 4)\); increasing on \((-2, 1)\)
- D) Increasing on \((-3, -2)\) and \((2, 4)\); decreasing on \((-1, 1)\); constant on \((-2, -1)\) and \((1, 2)\)
The graph of a function $f$ is given. Use the graph to answer the question.

14) Find the numbers, if any, at which $f$ has a local maximum. What are the local maxima?

A) $f$ has a local maximum at $x = -1$ and $1$; the local maximum is $0$
B) $f$ has a local maximum at $x = 0$; the local maximum is $3$
C) $f$ has a local maximum at $x = 1$; the local maximum is $3$
D) $f$ has no local maximum

15) Find the numbers, if any, at which $f$ has a local maximum. What are the local maxima?
A) $f$ has a local minimum at $x = -8$ and $2.2$; the local minimum at $-8$ is $5$; the local minimum at $2.2$ is $3.9$
B) $f$ has a local maximum at $x = 5$ and $3.9$; the local maximum at $5$ is $-8$; the local maximum at $3.9$ is $2.2$
C) $f$ has a local minimum at $x = 5$ and $3.9$; the local minimum at $5$ is $-8$; the local minimum at $3.9$ is $2.2$
D) $f$ has a local maximum at $x = -8$ and $2.2$; the local maximum at $-8$ is $5$; the local maximum at $2.2$ is $3.9$
For the graph of the function \( y = f(x) \), find the absolute maximum and the absolute minimum, if it exists.

16) 

A) Absolute maximum: \( f(5) = 6 \); Absolute minimum: \( f(2) = 1 \)
B) Absolute maximum: \( f(2) = 7 \); Absolute minimum: \( f(3) = 0 \)
C) Absolute maximum: \( f(6) = 5 \); Absolute minimum: \( f(1) = 2 \)
D) Absolute maximum: \( f(7) = 2 \); Absolute minimum: \( f(0) = 3 \)

17) 

A) Absolute maximum: \( f(3) = 5 \); Absolute minimum: \( f(1) = 2 \)
B) Absolute maximum: none; Absolute minimum: none
C) Absolute maximum: none; Absolute minimum: \( f(1) = 2 \)
D) Absolute maximum: \( f(-1) = 6 \); Absolute minimum: \( f(1) = 2 \)
18) A) Absolute maximum: none; Absolute minimum: f(1) = 2
B) Absolute maximum: f(4) = 7; Absolute minimum: f(1) = 2
C) Absolute maximum: none; Absolute minimum: none
D) Absolute maximum: f(4) = 7; Absolute minimum: none

For the function, find the average rate of change of f from 1 to x:
\[ \frac{f(x) - f(1)}{x - 1}, \ x \neq 1 \]

19) f(x) = x^2 - 2x
A) \[ \frac{x^2 - 2x - 1}{x - 1} \]
B) x + 1
C) 1
D) x - 1