

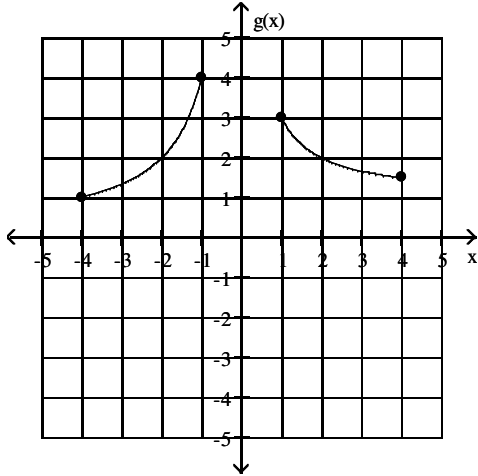
Chapter 4 Calculus Practice Quiz

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Find the location of the indicated absolute extremum for the function.

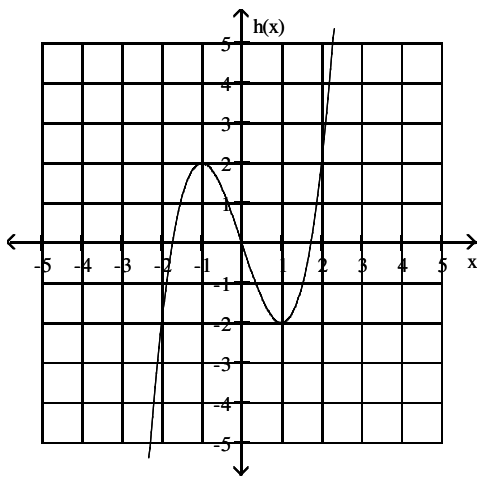
1) Maximum

1) _____



2) Minimum

2) _____



Find the extreme values of the function on the interval and where they occur.

3) $g(x) = -x^2 + 10x - 21$ on $3 \leq x \leq 7$

3) _____

Find the extreme values of the function and where they occur.

4) $y = \frac{x + 1}{x^2 + 2x + 2}$

4) _____

Give an appropriate answer.

5) Find the value or values of c that satisfy $\frac{f(b) - f(a)}{b - a} = f'(c)$ for the function $f(x) = x + \frac{27}{x}$ on the interval $[3, 9]$.

5) _____

Use analytic methods to find those values of x for which the given function is increasing and those values of x for which it is decreasing.

6) $f(x) = 27x - x^3$ 6) _____

Find all possible functions with the given derivative.

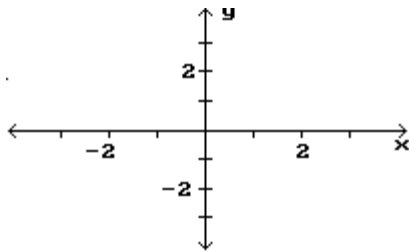
7) $f'(x) = 9x^2 + 18x + 5$ 7) _____

Find the function with the given derivative whose graph passes through the point P.

8) $f'(x) = x^2 + 9$, $P(3, 55)$ 8) _____

Sketch a graph of a function $y = f(x)$ that has the given properties.

- 9) a) Continuous and differentiable for all real numbers
 b) $f'(x) < 0$ on $(-\infty, -3)$ and $(3, \infty)$
 c) $f'(x) > 0$ on $(-3, 3)$
 d) $f(-3) = f(3) = 0$ 9) _____



Use the First Derivative Test to determine the local extrema of the function, and identify any absolute extrema.

10) $f(x) = -x\sqrt{9 - x^2}$ 10) _____

Use the Concavity Test to find the intervals where the graph of the function is concave up.

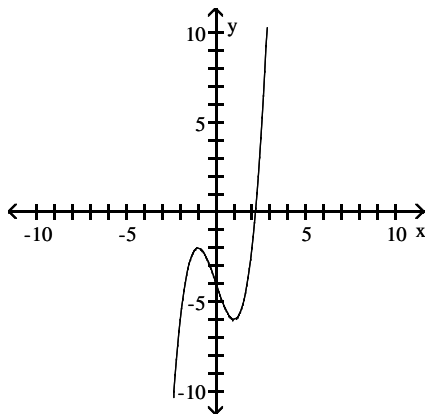
11) $y = -3x^2 + 18x + 4$ 11) _____

Find the points of inflection.

12) $y = x^3 - 3x^2 + 2x + 15$ 12) _____

Use the graph of f to estimate where f'' is 0, positive, and negative.

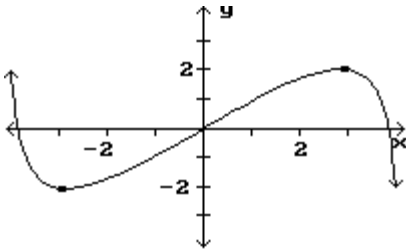
13) 13) _____



Answer Key

Testname: CHAPTER 4 CALCULUS PRACTICE QUIZ

- 1) $x = -1$
- 2) No minimum
- 3) Maximum value is 4 at $x = 5$; minimum value is 0 at $x = 7$ and 0 at $x = 3$
- 4) The maximum is $\frac{1}{2}$ at $x = 0$; the minimum is $-\frac{1}{2}$ at $x = -2$.
- 5) $3\sqrt{3}$
- 6) Increasing on $(-3, 3)$, decreasing on $(-\infty, -3)$ and $(3, \infty)$
- 7) $3x^3 + 9x^2 + 5x + C$
- 8) $f(x) = \frac{x^3}{3} + 9x + 19$
- 9) Possible Answer:



- 10) Absolute minimum $\left(\sqrt{\frac{9}{2}}, -\frac{9}{2}\right)$, absolute maximum $\left(-\sqrt{\frac{9}{2}}, \frac{9}{2}\right)$
- 11) None
- 12) $(1, 15)$
- 13) Zero: $x = 0$; positive: $(0, \infty)$; negative: $(-\infty, 0)$