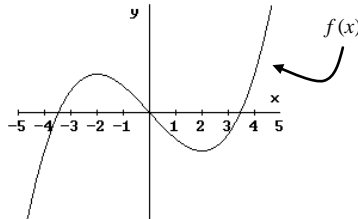AP Calculus
3.2 Worksheet

All work must be shown in this course for full credit. Unsupported answers may receive NO credit.
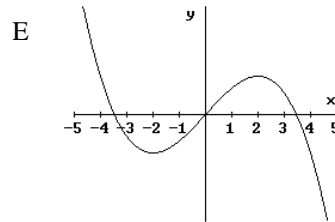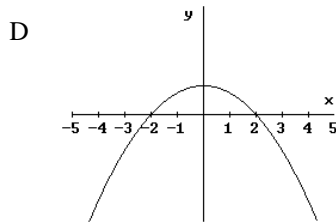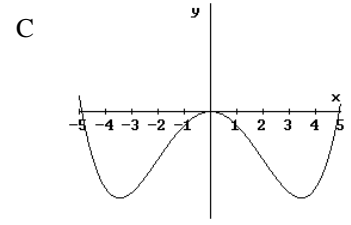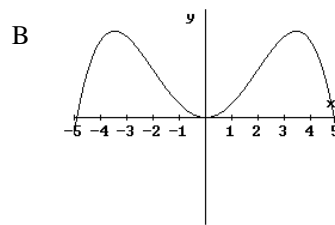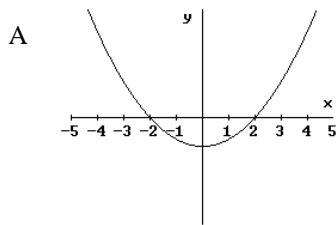
1. If $f(x) = 2 + |x+3|$ for all values of x, then the value of the derivative $f'(x)$ at $x = 3$ is

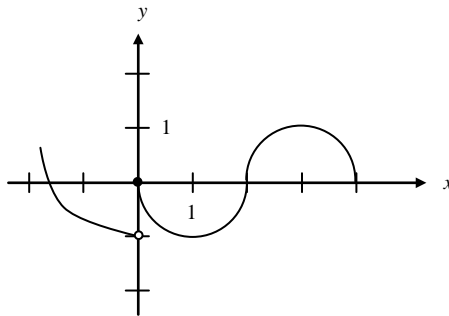A) -1 B) 0   C) 1   D) 2   E) nonexistent

2. The graph of $f(x)$ is shown in the figure below.

Which of the following could be the graph of $f'(x)$?

3. The graph of the function f shown in the figure below has a vertical tangent at the point $(2, 0)$ and horizontal tangents at the points $(1, -1)$ and $(3, 1)$.

For what values of x, $-2 < x < 4$, is f not differentiable?

A) 0 only   B) 0 and 2 only   C) 1 and 3 only   D) 0, 1, and 3 only   E) 0, 1, 2, and 3

4. If f is a function such that $\lim\limits_{x \to 2} \dfrac{f(x)-f(2)}{x-2}=0$, which of the following must be true?

A) The limit of $f(x)$ as x approaches 2 does not exist.
B) f is not defined at $x = 2$.
C) The derivative of f at $x = 2$ is 0.
D) f is continuous at $x = 0$.
E) $f(2) = 0$

5. Let f be a function such that $\lim\limits_{h \to 0} \dfrac{f(2+h)-f(2)}{h}=5$. Which of the following must be true?
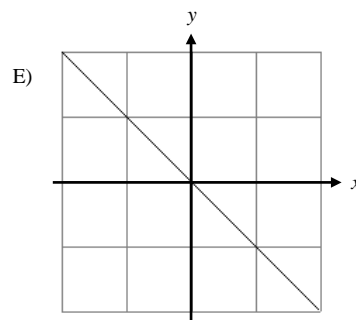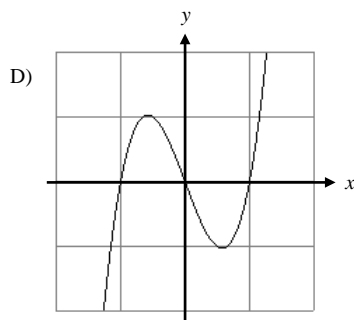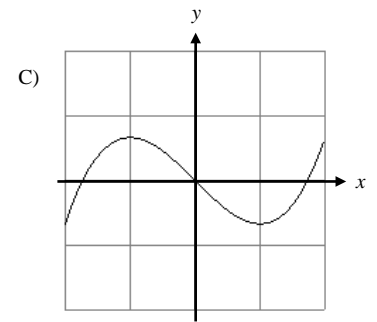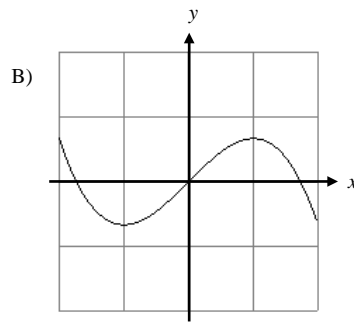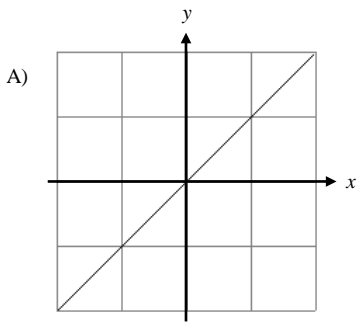
    I. f is continuous at $x = 2$.
    II. f is differentiable at $x = 2$.
    III. The derivative of f is continuous at $x = 2$.

A) I only   B) II only   C) I and II only   D) I and III only   E) II and III only

6. The graph of the ***derivative*** of f is shown below.
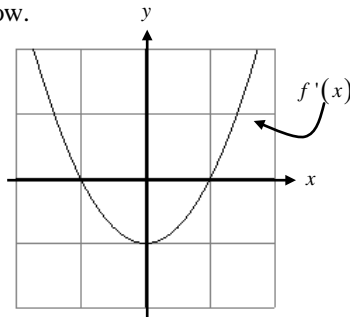
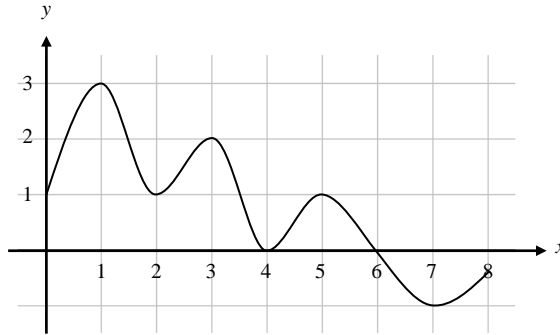Which of the following could be the graph of f?

7. Let f be a function that is differentiable on the open interval (0, 10). If $f(2) = -5$, and $f(5) = 5$, and $f(9) = -5$, which of the following must be true?

      I. f has at least 2 zeros.
     II. The graph of f has at least one horizontal tangent line.
     III. For some c, $2 < c < 5$, $f(c) = 3$.

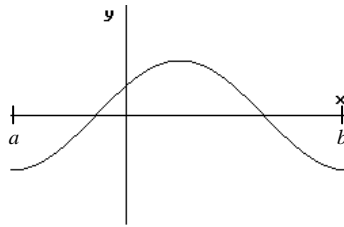A) none   B) I and II only   C) I only   D) I and III only   E) I, II, and III

8. The function f is defined on the closed interval [0, 8]. The graph of its derivative f' is shown below.
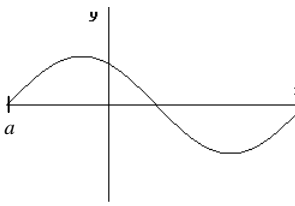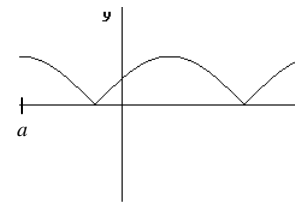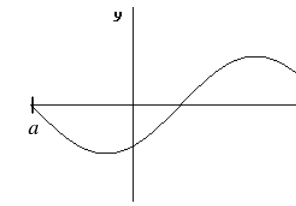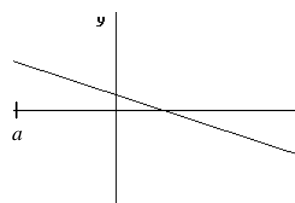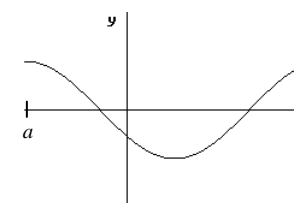

The point (3, 5) is on the graph of $f(x)$. An equation of the tangent line to the graph of f at (3, 5) is

A) $y = 2$ B) $y = 5$ C) $y - 5 = 2(x - 3)$ D) $y + 5 = 2(x - 3)$ E) $y + 5 = 2(x + 3)$

9. The graph of f is shown below.

Which of the following could be the graph of the derivative of f?

A.

B.

C.

D.

E.

10. Complete the following questions from the textbook: pages 114 – 115: #5 – 10, 11 – 16 (calculator), 39

11. Complete the Worksheet: Graphs of f, f', f'', and F