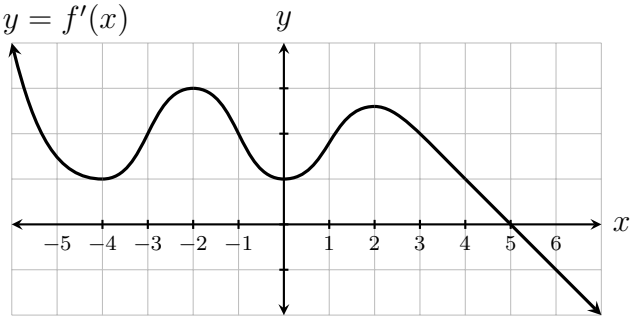
Name: _____

Quiz 16 ♡

MATH 200
March 24, 2026

1. (10 points) Use the second derivative test to find the local extrema of $f(x) = x^3 + 3x^2 + 10$.

2. (10 points) The graph of the **derivative** $f'(x)$ of a function $f(x)$ is shown below. Answer the following questions about the function $f(x)$.



   (a) State the critical points of f.

   (b) State the interval(s) on which f increases.

   (c) State the interval(s) on which f decreases.

   (d) State the intervals on which f is concave up.

   (e) State the intervals on which f is concave down.

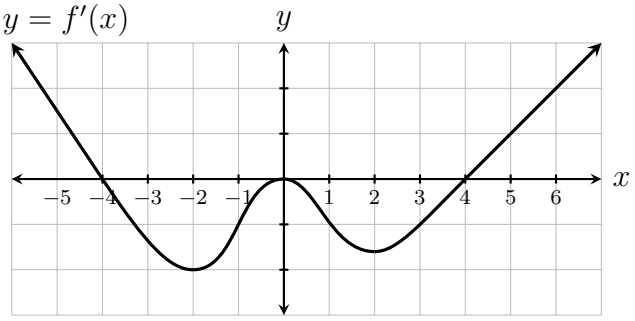
Name: _____

Quiz 16 ♠

MATH 200
March 24, 2026

1. (10 points) Use the second derivative test to find the local extrema of $f(x) = xe^{-x}$.

2. (10 points) The graph of the **derivative** $f'(x)$ of a function $f(x)$ is shown below. Answer the following questions about the function $f(x)$.



   (a) State the critical points of f.

   (b) State the interval(s) on which f increases.

   (c) State the interval(s) on which f decreases.

   (d) State the intervals on which f is concave up.

   (e) State the intervals on which f is concave down.

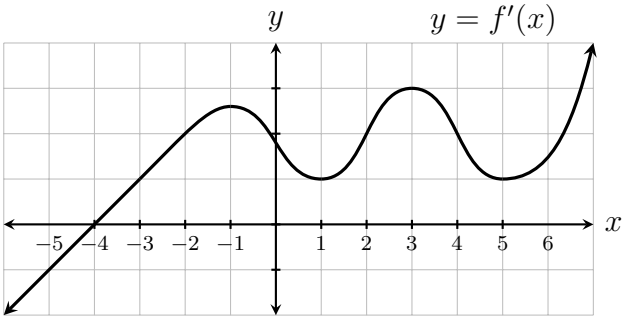
Name: _____

Quiz 16 ♣

MATH 200
March 24, 2026

1. (10 points) Use the second derivative test to find the local extrema of $f(x) = xe^x + e^x$.

2. (10 points) The graph of the **derivative** $f'(x)$ of a function $f(x)$ is shown below. Answer the following questions about the function $f(x)$.



   (a) State the critical points of f.

   (b) State the interval(s) on which f increases.

   (c) State the interval(s) on which f decreases.

   (d) State the intervals on which f is concave up.

   (e) State the intervals on which f is concave down.

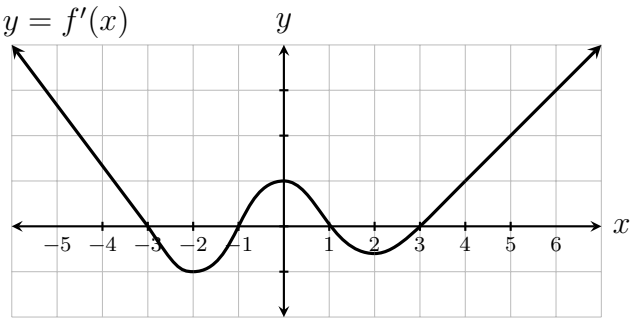
Name: _____

Quiz 16 ♢

MATH 200
March 24, 2026

1. (10 points) Use the second derivative test to find the local extrema of $f(x) = e^{x^2-2x}$.

2. (10 points) The graph of the **derivative** $f'(x)$ of a function $f(x)$ is shown below. Answer the following questions about the function $f(x)$.



(a) State the critical points of f.

(b) State the interval(s) on which f increases.

(c) State the interval(s) on which f decreases.

(d) State the intervals on which f is concave up.

(e) State the intervals on which f is concave down.