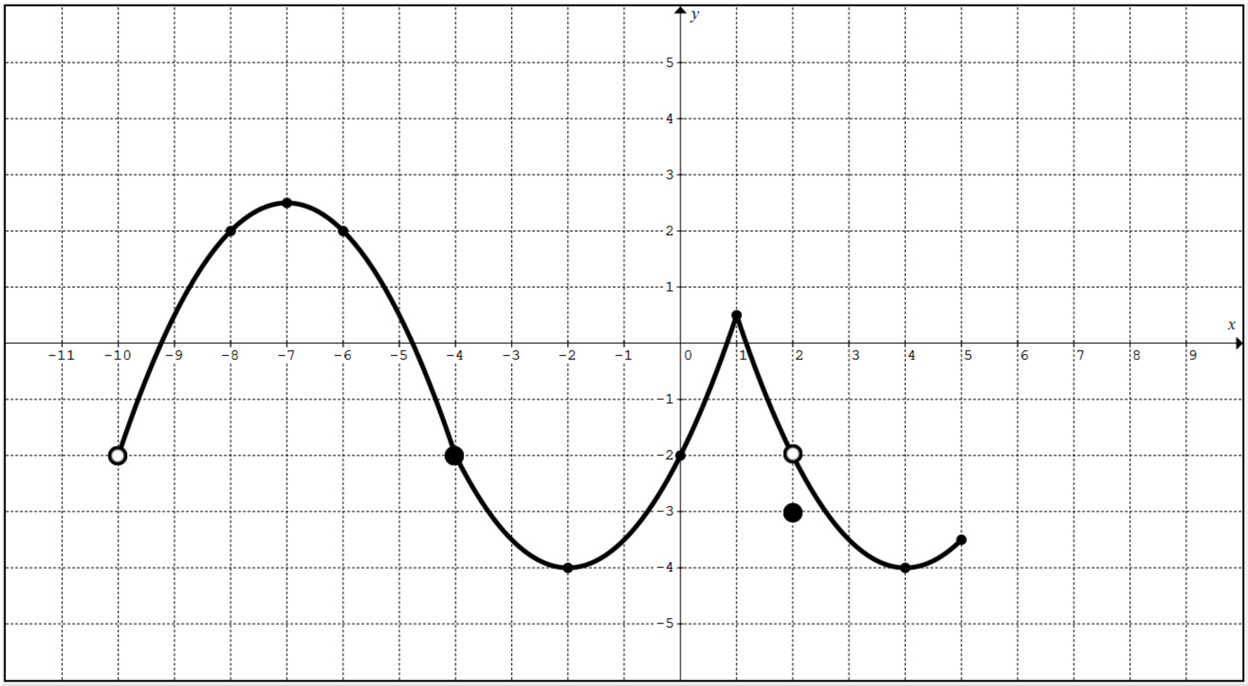


QUESTION #1: Above is the graph of the function $y = f(x)$.

☐ Vertices, integer coordinates, and the endpoint (5, -3.5) have been highlighted.

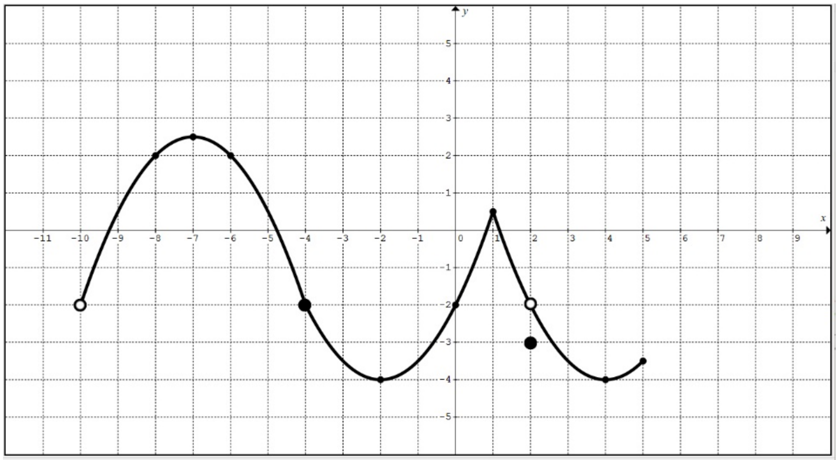
☐ $f'(-4) = -2$

A. Write the appropriate justification for *x*-values on $-10 < x < 5$ where the function *f* is not continuous.

B. Find the values of *x* for which the function *f* is increasing. Justify with slope.

C. Find the values of *x* on $-10 < x < 5$ for which the function *f* has a relative maximum. Justify with slope.

D. Find or estimate the values of *x* for which the function *f* is concave downward. Justify with slope.



QUESTION #1 (CONTINUED): Above is the graph of the function $y = f(x)$.

☐ Vertices, integer coordinates, and the endpoint (5, -3.5) have been highlighted.

☐ $f'(-4) = -2$

E. Find the average slope over $-8 \le x \le 0$

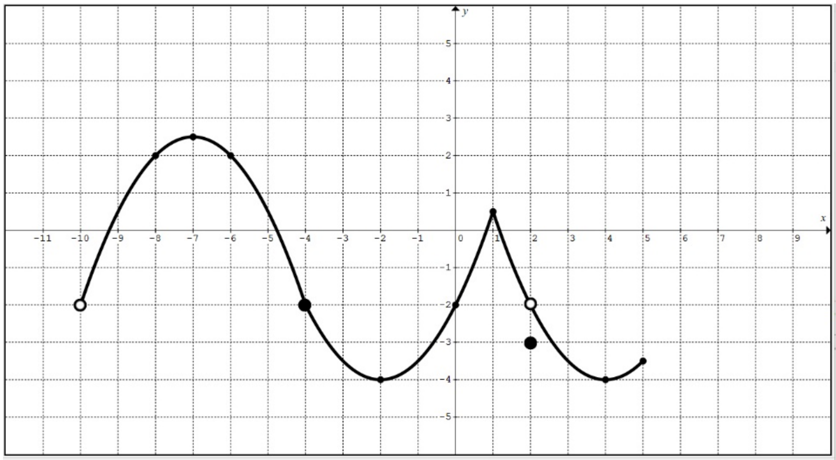
F1. Find or estimate $f'(-5)$

F2. Find or estimate $\frac{dy}{dx}$ at $x = 4.5$

F3. Find or estimate $f'(1)$

F4. Find or estimate $f'(2)$

G. Find or estimate the *x*-values where *f* has a horizontal tangent



QUESTION #1 (CONTINUED): Above is the graph of the function $y = f(x)$.

☐ Vertices, integer coordinates, and the endpoint (5, -3.5) have been highlighted.

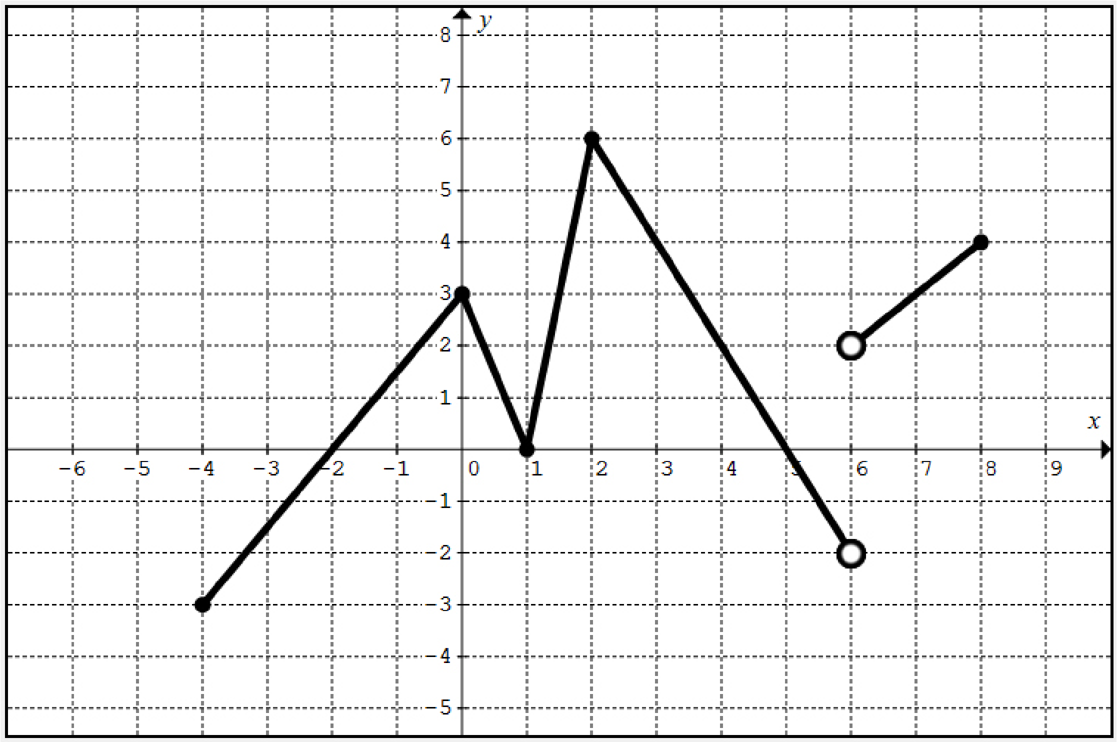
☐ $f'(-4) = -2$

H. Explain why the Mean Value Theorem applies on [-8, -4] and estimate or find the *x*-value(s) where the instantaneous slope is equal to the average slope on [-8, -4]. Show this graphically.

I. Write a point-slope equation of the line tangent to *f* at $x = -4$.

J. True or False: $f'_{-}(1) > f'_{+}(1)$ EXPLAIN

K. True or False: The graph of *f* has a smooth slope transition at the point $(-4, -2)$ EXPLAIN



QUESTION #2: Above is the graph of g' (the **derivative** of the graph of g).

This graph is made up of line segments.

It is know that the function g is continuous on $-4 \le x \le 8$ with $g(4) = 20$.

A. For what values of x on $-4 < x < 8$ does the function g have a relative maximum? Justify with slope.

B. For what values of x on $-4 < x < 8$ does the function g have a relative minimum?

C. For what values of x on $-4 < x < 8$ does is function g concave downward? Justify with slope.

D. True or False: $g(3) < g(5)$: EXPLAIN

E. Write an equation in point-slope form of a line tangent to $y = g(x)$ at $x = 4$.

QUESTION #3:

Draw a quick sketch of a function $y = q(x)$ that possesses the following properties:

$\lim_{x \to \infty} q(x) = 0$

$\lim_{x \to -\infty} q(x) = 2$

$\lim_{x \to 2} q(x) = \infty$

$\lim_{x \to -4^+} q(x) = \infty$

$\lim_{x \to -4^-} q(x) = -\infty$

QUESTION #4:

Draw a quick sketch of the functions $y = \sin x$ and $y = e^x$.

QUESTION #5:

A. Evaluate $\cos\left(\frac{2\pi}{3}\right)$

B. Evaluate $\csc\left(\frac{5\pi}{3}\right)$

C. Solve the equation: $\cos x - 2\sin x \cos x = 0$ on the domain $D: \{x \mid 0 \le x \le 2\pi\}$