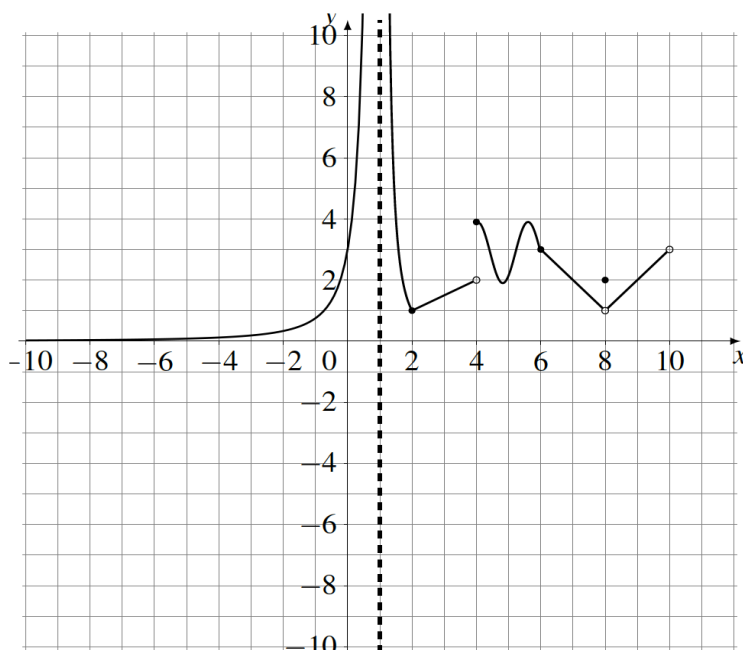


Name: _____

Group #: _____

1. Consider the graph of $f(x)$ given below:



- (a) Find the following:

i. $\lim_{x \rightarrow 4} f(x)$

iv. $\lim_{x \rightarrow 10^-} f(x)$

ii. $\lim_{x \rightarrow 1^+} f(x)$

v. $\lim_{x \rightarrow -\infty} f(x)$

iii. $\lim_{x \rightarrow 8} f(x)$

vi. $f'(3)$

- (b) State any horizontal and vertical asymptotes for $f(x)$. If there are none, state that.

- (c) Identify any points of discontinuity for $f(x)$ **AND** indicate the type of discontinuity for each one.

- (d) At which points, if any, is $f(x)$ continuous **but not** differentiable? State the x -value of any such points.

2. Use the limit definition of the derivative to find the derivative of $f(x) = x^3 - 9x$.

3. Using limits, find an equation of the line tangent to the function $g(x) = \frac{4}{x^2}$ at $x = -2$.

4. Using the limit definition of the derivative, find the derivative of $g(x) = \sqrt{2x + 1}$.
5. Using limits, find an equation of the line tangent to the function $f(x) = 5x - 3x^2$ at $x = 2$.