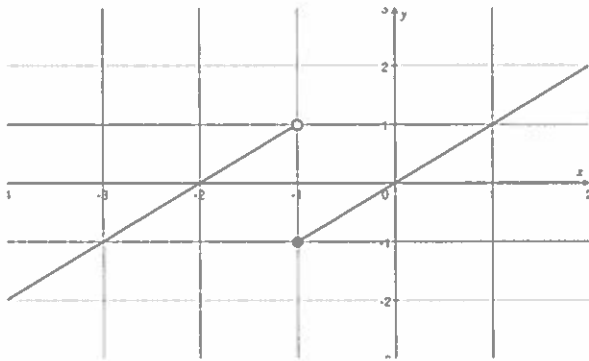


Write your name continuously here: Key Period: _____

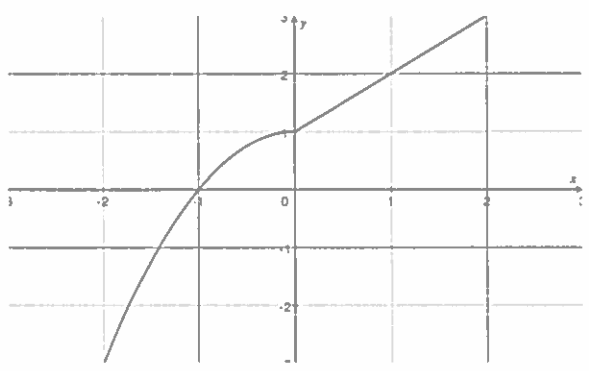
AP Calculus AB: 4.1 Differentiable Graphically

Write whether the following functions are differentiable or not. If they are not differentiable give the reason.



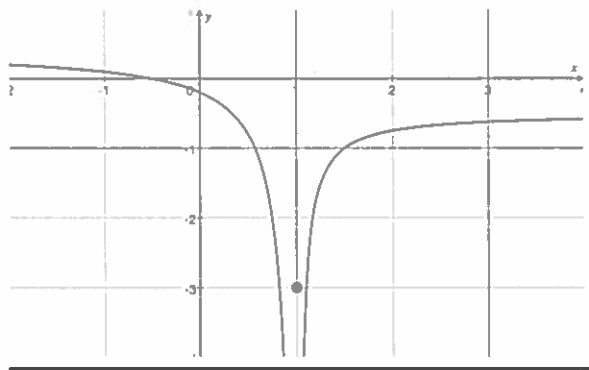
Is the function differentiable at $x = -1$?

No
 $\lim_{x \rightarrow -1} f(x)$ DNE



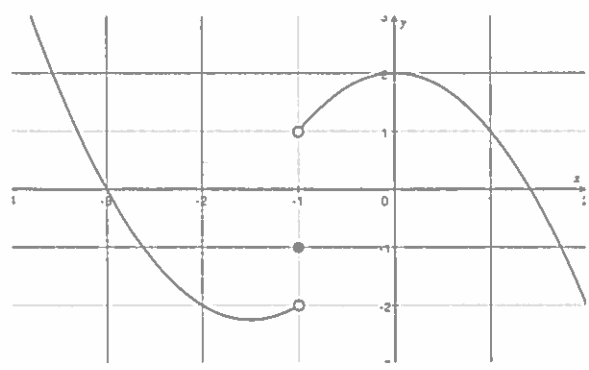
Is the function differentiable at $x = 0$?

No
 $\lim_{x \rightarrow 0^-} f'(x) \neq \lim_{x \rightarrow 0^+} f'(x)$



Is the function differentiable at $x = 1$?

No
 $\lim_{x \rightarrow 1} f(x) \neq f(1)$



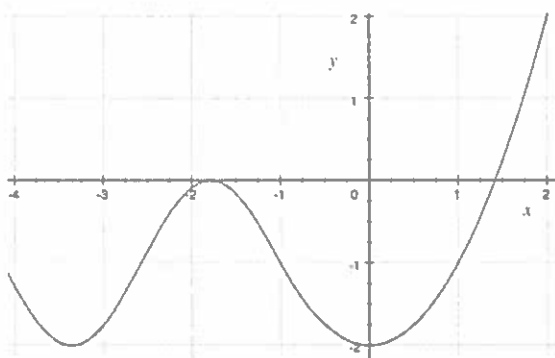
Is the function differentiable at $x = -1$?

No
 $\lim_{x \rightarrow -1} f(x)$ DNE

Is the function differentiable at $x = 1$?

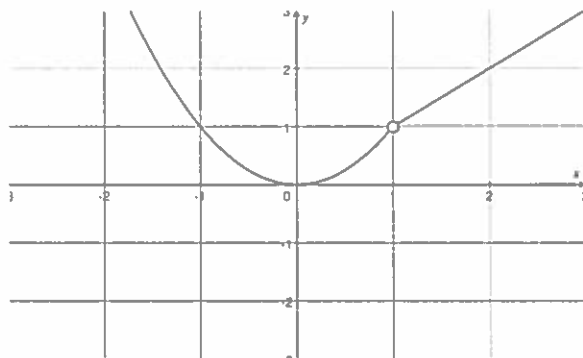
Yes

Write your name continuously here: _____ Period: _____



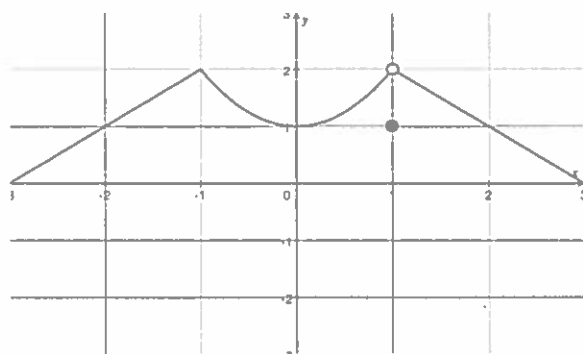
Is the function differentiable at $x=-1$?

Yes



Is the function differentiable at $x=1$?

No
 $f'(1)$ DNE



Is the function differentiable at $x=-1$?

No
 $\lim_{x \rightarrow -1^-} f'(x) \neq \lim_{x \rightarrow -1^+} f'(x)$

Is the function differentiable at $x=0$?

Yes

Using your infinite wisdom, and some math knowledge, tell me if you think the functions below are differentiable from $-\infty$ to ∞ or not.

1. $y = 2x^2 + 3x - 5$

Yes

2. $y = \frac{2x^2 - 9x - 5}{2x + 1}$ *vertical asymptote*

No $f(-\frac{1}{2})$ DNE

3. $y = \sqrt{x+1}$

No it's not continuous

4. $y = \sqrt[3]{x+1}$

Yes

5. $f(x) = \begin{cases} \frac{x}{2} + 5, & x < 6 \\ 8x, & x \geq 6 \end{cases}$

No $\lim_{x \rightarrow 6} f(x)$ DNE