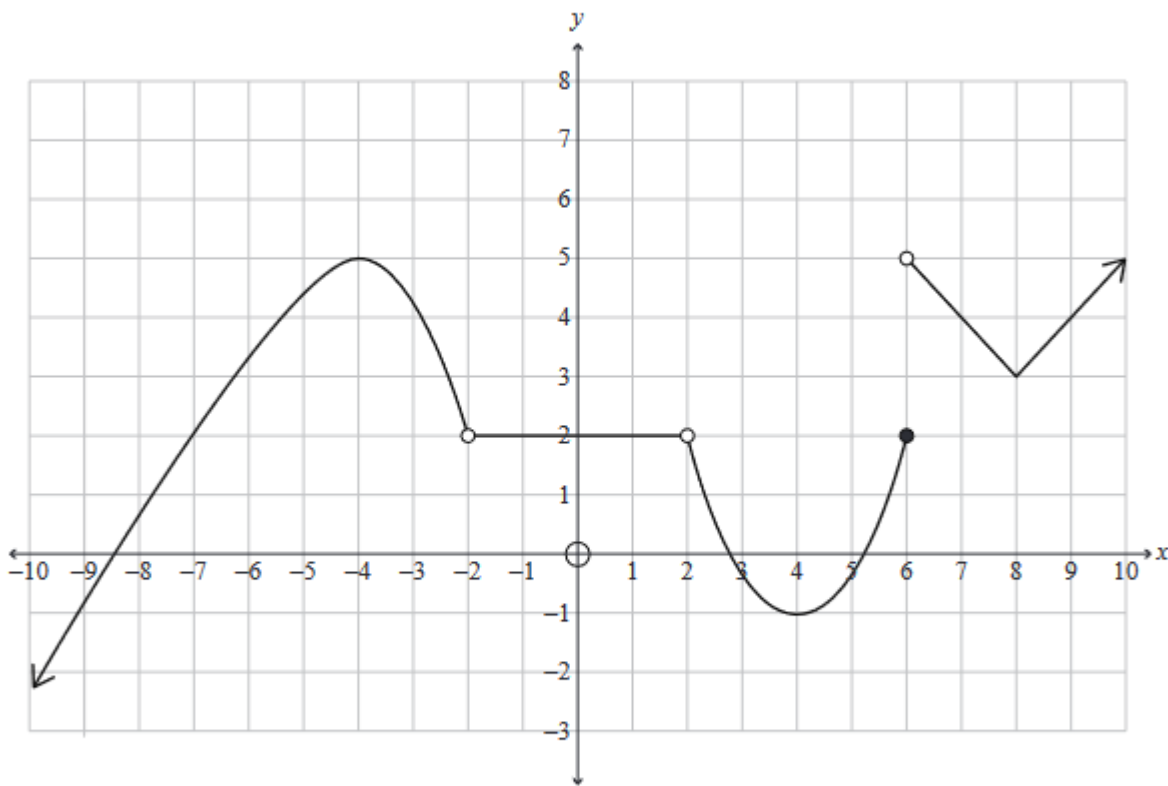




Differentiation Collated Past Papers – Interpreting Graphs

2023 Question 3b.

(b) The graph below shows the function $y = f(x)$.



For the function above:

- (i) Find the value(s) of x where $f(x)$ is continuous but not differentiable.

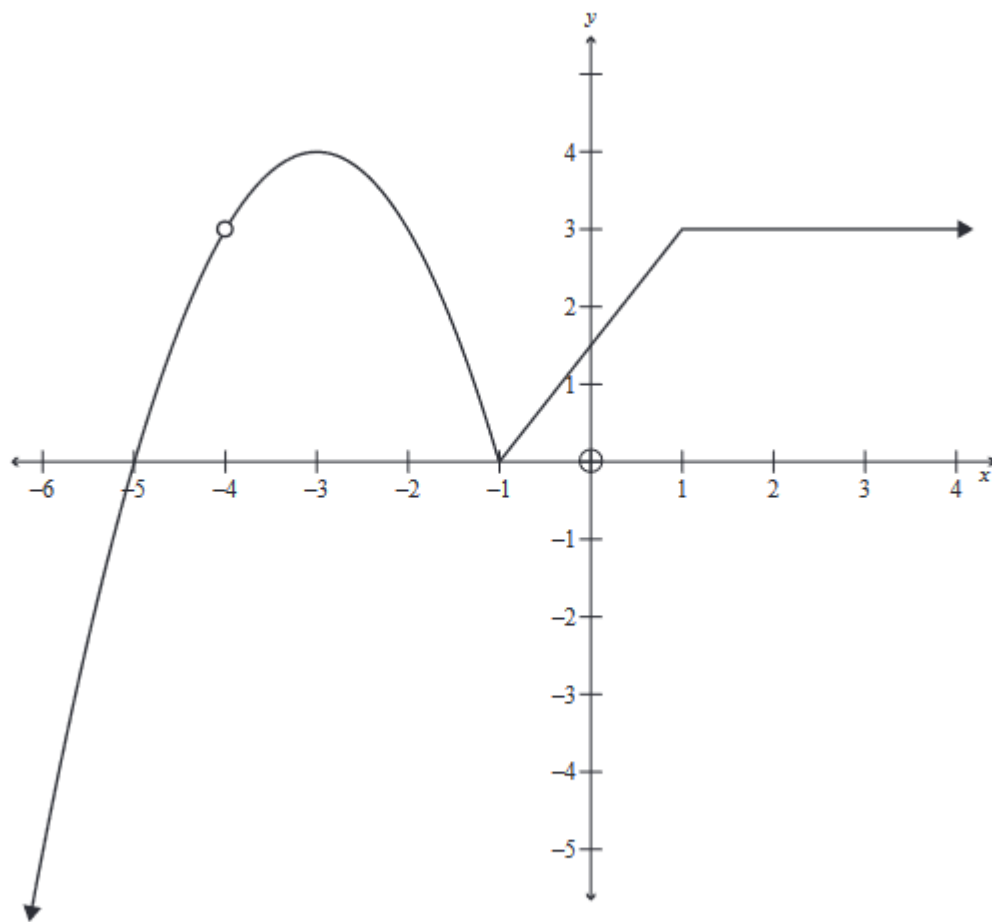
- (ii) Find the value(s) of x where $f'(x) = 0$ and $f''(x) < 0$ are both true.

- (iii) What is the value of $\lim_{x \rightarrow 6} f(x)$?
State clearly if the value does not exist.



2022 Question 3b.

b) The graph below shows the function $y = f(x)$.



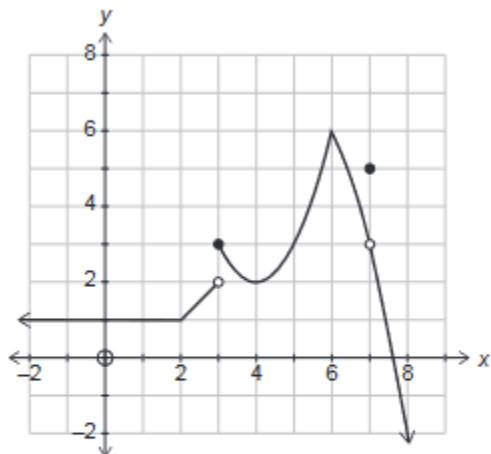
For the function above:

- (i) Find the value(s) of x where $f(x)$ is not differentiable.
- (ii) Find the value(s) of x for which $f'(x) = 0$.
- (iii) What is the value of $\lim_{x \rightarrow -4} f(x)$? _____
(State clearly if the value does not exist.)



2021 Question 1b.

(b) The graph below shows the function $y = f(x)$.



For the function above:

(i) Find the value(s) of x that meet the following conditions:

(1) $f'(x) = 0$: _____

(2) $f(x)$ is concave upwards: _____

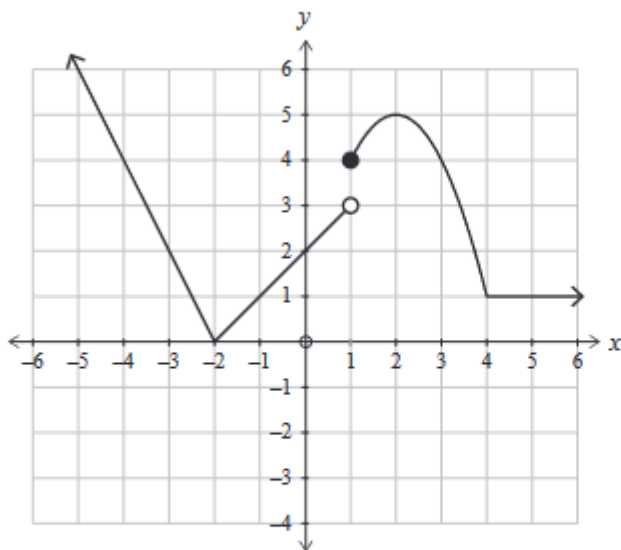
(ii) What is the value of $\lim_{x \rightarrow 7} f(x)$: _____

State clearly if the value does not exist.



2019 Question 3b.

(b) The graph below shows the function $y = f(x)$.



(i) Find all the value(s) of x which meet each of the following conditions:

1. $f'(x) = 0$: _____

2. $f(x)$ is not differentiable: _____

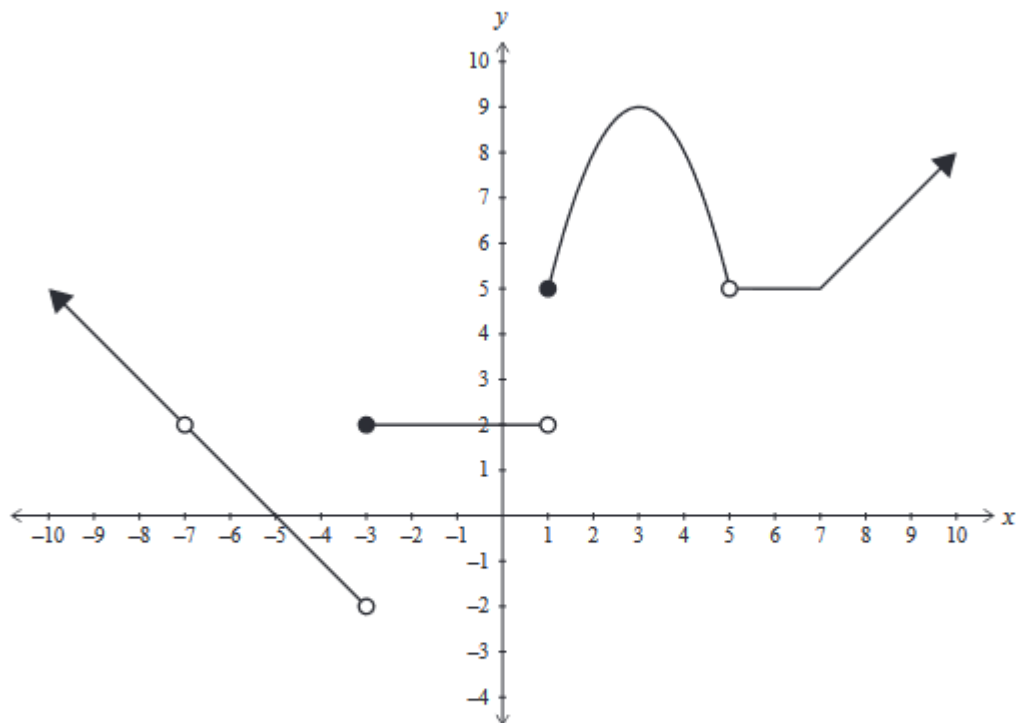
(ii) What is the value of $\lim_{x \rightarrow 1} f(x)$? _____

State clearly if the value does not exist.



2018 Question 2c.

(c) The diagram below shows the graph of the function $y = f(x)$.



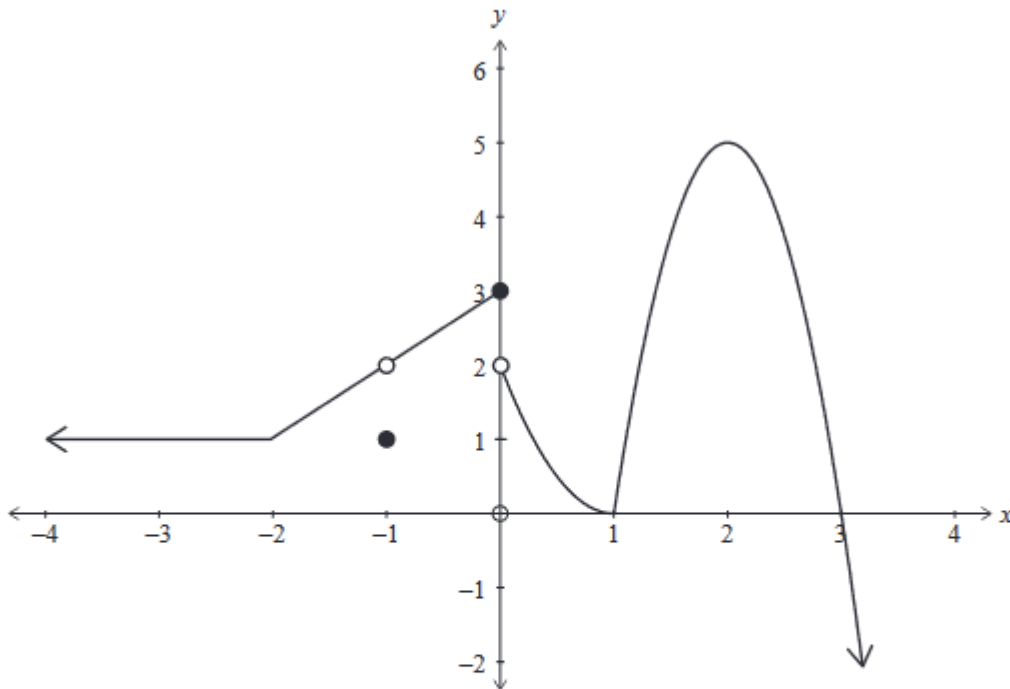
For the function above:

- (i) What is the value of $f(1)$? _____
State clearly if the value does not exist.
- (ii) For what value(s) of x does the function $f(x)$ not have a limit? _____
- (iii) Find all the value(s) of x that meet the following conditions:
- $f'(x) > 0$: _____
 - $f'(x) = 0$ and $f''(x) < 0$: _____
 - $f(x)$ is continuous but not differentiable: _____



2017 Question 3c.

(c) The graph below shows the function $y = f(x)$.



For the function above:

(i) Find the value(s) of x that meet the following conditions:

(1) $f'(x) = 0$: _____

(2) $f(x)$ is continuous but not differentiable: _____

(3) $f(x)$ is not continuous: _____

(4) $f''(x) < 0$: _____

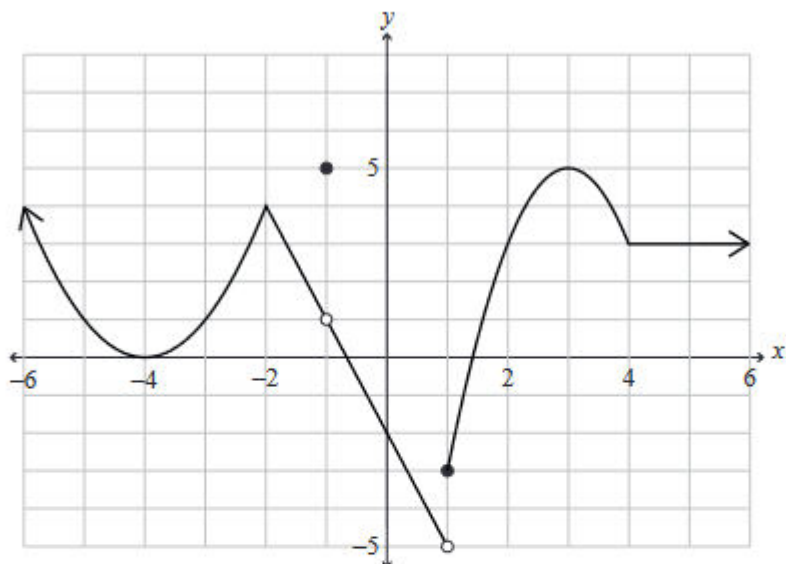
(ii) What is the value of $\lim_{x \rightarrow -1} f(x)$? _____

State clearly if the value does not exist.



2016 Question 2c.

c) The graph below shows the function $y = f(x)$.



For the function $y = f(x)$ above:

(i) Find the value(s) of x that meet the following conditions:

1. f is not continuous: _____
2. f is not differentiable: _____
3. $f'(x) = 0$: _____
4. $f''(x) < 0$: _____

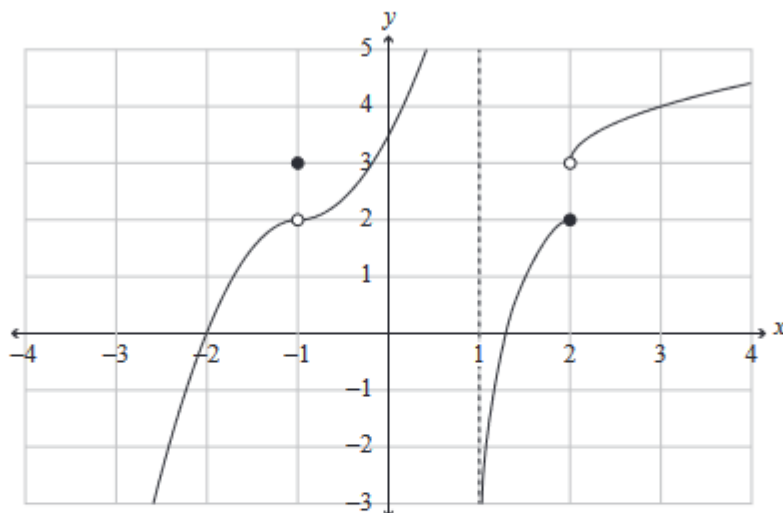
(ii) What is the value of $\lim_{x \rightarrow -1} f(x)$?

State clearly if the value of the limit does not exist.



2015 Question 2c.

(c) The graph below shows the function $y = f(x)$.



For the function above:

(i) Find the value(s) of x that meet the following conditions:

1. $f(x)$ is not defined: _____
2. $f(x)$ is not differentiable: _____
3. $f''(x) > 0$: _____

(ii) What is the value of $f(-1)$? _____

State clearly if the value does not exist.

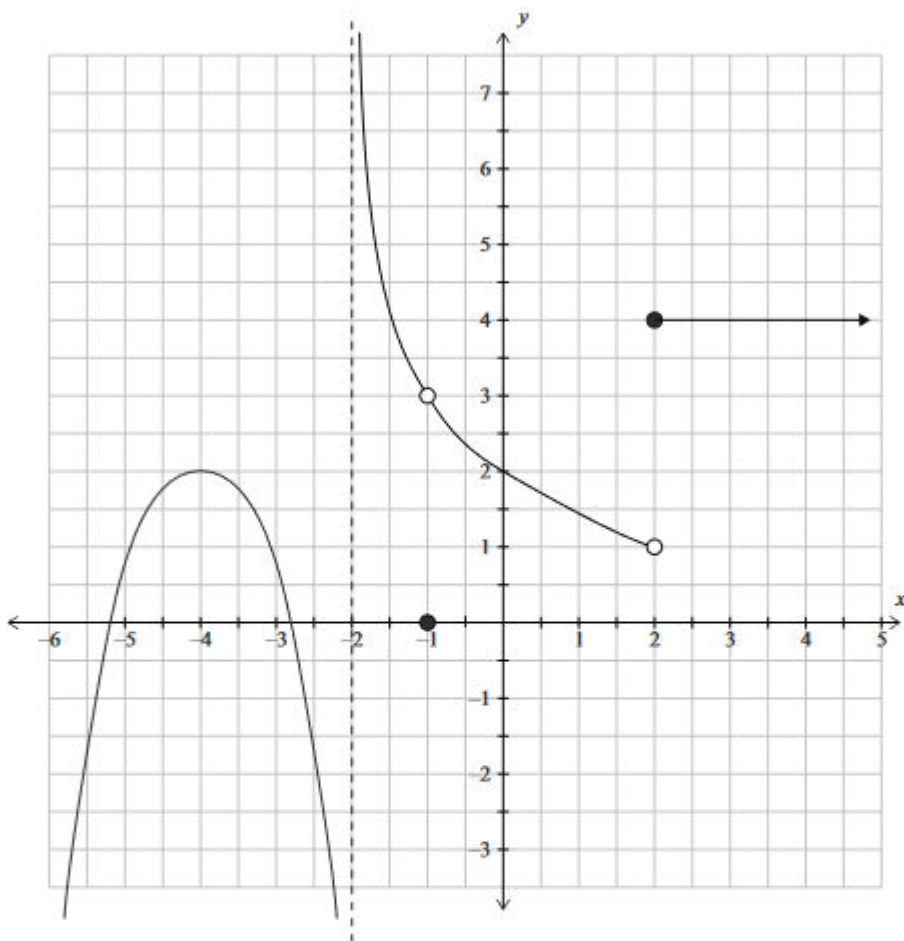
(iii) What is the value of $\lim_{x \rightarrow 2} f(x)$? _____

State clearly if the value does not exist.



2014 Question 2c.

(c) The graph below shows the function $y = f(x)$.



For the function $f(x)$ above:

(i) Find the value(s) for x that meet the following conditions:

1. $f(x)$ is not differentiable: _____
2. $f''(x) < 0$: _____
3. $f(x)$ is not defined: _____

(ii) What is the value of $f(2)$? _____

State clearly if the value does not exist.

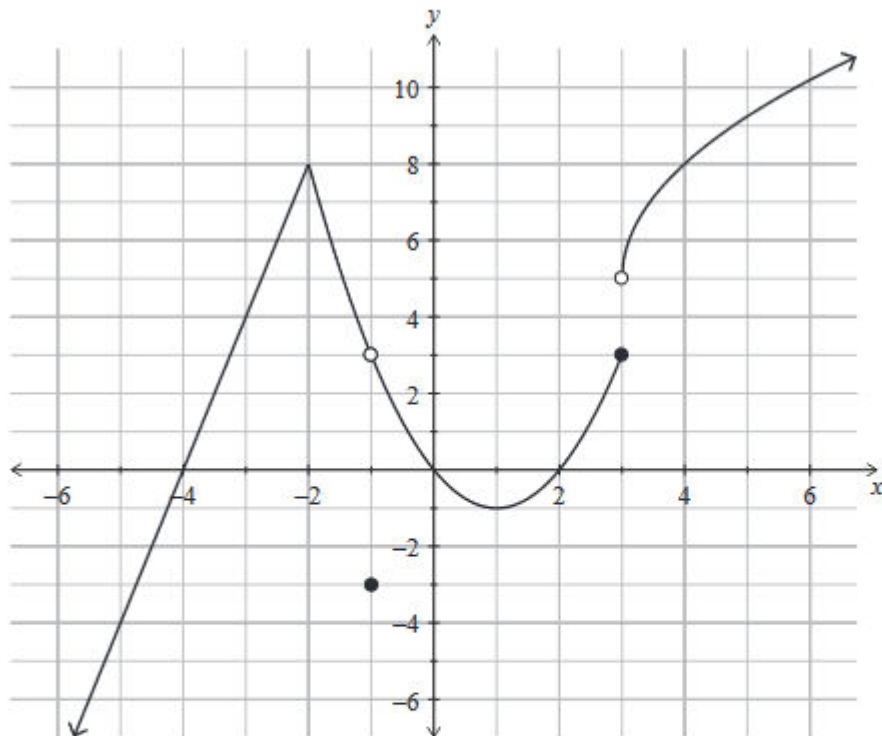
(iii) What is the value of $\lim_{x \rightarrow -1} f(x)$? _____

State clearly if the value does not exist.



2013 Question 2d.

(d) The graph below shows the function $y = f(x)$.



For the function $f(x)$ above:

(i) Find all the value(s) of x that meet each of the following conditions:

1. $f'(x) = 0$ _____
2. $f''(x) < 0$ _____
3. $f(x)$ is not differentiable _____

(ii) What is the value of $f(-1)$? _____

(iii) What is the value of $\lim_{x \rightarrow 3} f(x)$?

State clearly if the value does not exist.

