

Exercise walk-through

5.3

Determining Intervals on Which a Function Is Increasing or Decreasing

AP Calculus AB

You must be able to

- use the sign of f' to find where f is **increasing** or **decreasing**

1

The method

Method — Increasing and decreasing

- f is **increasing** where $f' > 0$;
- f is **decreasing** where $f' < 0$.

Test the sign of f' on the intervals between critical points.

Exercises 2.1-2.3

2.1 State where f is increasing.

[1]

2.2 For $f'(x) = 2x - 4$, find where f is increasing.

[2]

2.3 For the same f' , state where f is decreasing.

[1]

Exercises 2.1-2.3

2.1 State where f is increasing. [1]

2.1

- where $f' > 0$
-

2.2 For $f'(x) = 2x - 4$, find where f is increasing. [2]

2.2

- $2x - 4 > 0 \Rightarrow x > 2$
-

2.3 For the same f' , state where f is decreasing. [1]

2.3

- $x < 2$

Exercises 3.1-3.2

3.1 f is increasing where

[1]

☐

A $f' < 0$

B $f' > 0$

C $f'' > 0$

D $f = 0$

☐

3.2 If $f'(x) = 2x - 4$, then f is decreasing for

[1]

A $x > 2$

B $x < 2$

C all x

D $x = 2$

Exercises 3.1·3.2

3.1 f is increasing where

[1]

☐

A $f' < 0$

B $f' > 0$

C $f'' > 0$

D $f = 0$

3.1 B

- $f' > 0$.

3.2 If $f'(x) = 2x - 4$, then f is decreasing for

[1]

☐

A $x > 2$

B $x < 2$

C all x

D $x = 2$

3.2 B

- $x < 2$.

Exercise 3.3 (a)

3.3 $f'(x) = 3x^2 - 3$.

(a) Solve $f' = 0$.

[1]

Exercise 3.3 (a)

3.3 $f'(x) = 3x^2 - 3$.

(a) Solve $f' = 0$.

[1]

(a)

- $x = \pm 1$

Exercise 3.3 (b)

3.3 $f'(x) = 3x^2 - 3$.

(b) Test a point in $(-1, 1)$.

[1]

Exercise 3.3 (b)

3.3 $f'(x) = 3x^2 - 3$.

(b) Test a point in $(-1, 1)$.

[1]

(b)

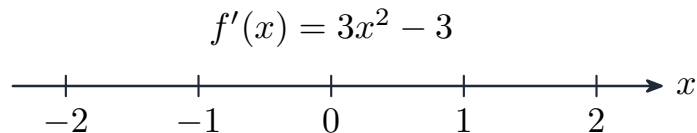
- $f'(0) = -3 < 0$

Exercise 3.3 (c)

3.3 $f'(x) = 3x^2 - 3$.

(c) State where f is decreasing.

[1]

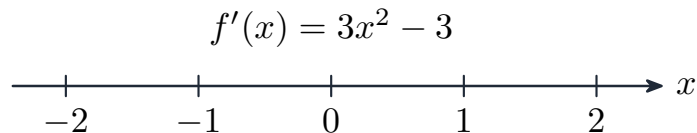


Exercise 3.3 (c)

3.3 $f'(x) = 3x^2 - 3$.

(c) State where f is decreasing.

[1]



(c)

- $(-1, 1)$