



Solve optimization problems

1Find the derivative $f'(x)$.

$$f(x) = \frac{4}{6}$$

- | | |
|-------------------------|--------------------------|
| A $f'(x) = \frac{4}{6}$ | B $f'(x) = 1$ |
| C $f'(x) = 0$ | D $f'(x) = \frac{4}{6}x$ |

2

What are the critical numbers (x-values) of the extrema (maxima or minima)?

$$f(x) = 2x^3 - 12x^2 + 3$$

$$f'(x) = 6x^2 - 24x$$

- | | |
|-----------------|--------------|
| A $x = 0, 2, 4$ | B $x = 0, 4$ |
| C $x = 0$ | D $x = 2$ |

3

What are the critical points of the extrema (maxima or minima)?

$$f(x) = 2x^3 - 18x^2 + 48x + 1$$

$$f'(x) = 6x^2 - 36x + 48$$

- | | |
|---------------------------|---------------------------|
| A $(3, 37)$ | B $(2, 0)$ and $(4, 0)$ |
| C $(2, 41)$ and $(4, 33)$ | D $(2, 33)$ and $(4, 41)$ |

4

What are the critical values (y-values) of the extrema (maxima or minima)?

$$f(x) = 2x^3 + 18x^2 + 48x - 3$$

$$f'(x) = 6x^2 + 36x + 48$$

- | | |
|------------------|-------------|
| A $y = -4, -2$ | B $y = -39$ |
| C $y = -35, -43$ | D $y = -35$ |

5

What are the critical points of the function?

$$f(x) = 2x^3 + 6x^2 - 4$$

$$f'(x) = 6x^2 + 12x$$

$$f''(x) = 12x + 12$$

- | | |
|--------------------------|---------------------------|
| A $(-2, 0)$ and $(0, 0)$ | B $(-2, -4)$ and $(0, 4)$ |
| C $(-1, 0)$ | D $(-2, 4)$ and $(0, -4)$ |

6

What are the critical values (y-values) of the function?

$$f(x) = 2x^3 + 6x^2 - 4$$

$$f'(x) = 6x^2 + 12x$$

$$f''(x) = 12x + 12$$

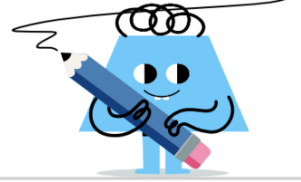
- | | |
|---------------|-----------|
| A $y = -2, 0$ | B $y = 4$ |
| C $y = 4, -4$ | D $y = 0$ |

7

What are the critical points of the extrema (maxima or minima)?

$$f(x) = -2x^3 + 12x^2 - 18x + 4$$

- | |
|--------------------------|
| A $(1, 4)$ and $(3, -4)$ |
| B $(2, 0)$ |
| C $(1, 0)$ and $(3, 0)$ |
| D $(1, -4)$ and $(3, 4)$ |

**Solve optimization problems****8**

What are the critical points of the function?

$$f(x) = 2x^3 - 12x^2 + 1$$

A (0, 1) and (4, -63)

B (2, -31)

C (0, 0) and (4, 0)

D (0, -63) and (4, 1)

9

What is the absolute minimum value (y-value)?

$$f(x) = -2x^3 - 6x^2 - 1$$

on $[-3, 2]$

A -42

B -40

C -39

D -41

10

What are the extreme values (y-values) on the interval?

$$f(x) = -2x^3 + 12x^2 - 18x + 1$$

on $[-1, 5]$

A Maximum value 33, minimum value -39

B Maximum value 35, minimum value -39

C Maximum value 33, minimum value -41

D Maximum value -39, minimum value 33

11

What is the absolute minimum value (y-value)?

$$f(x) = -2x^3 - 6x^2 - 2$$

on $[-4, 2]$

A -41

B -40

C -43

D -42

12

What are the extreme values (y-values) on the interval?

$$f(x) = 2x^3 - 6x^2$$

on $[-1, 3]$

A Maximum value -8, minimum value 0

B Maximum value 0, minimum value -8

C Maximum value 2, minimum value -8

D Maximum value 0, minimum value -10