Derivative Tests: Critical Points & Concavity · 1

Find the critical numbers of $f(x) = x^3 - 3x^2 + 7$.

Derivative Tests: Critical Points & Concavity · 2

Find the critical numbers of $f(x) = x^3 - 6x^2 + 9x - 5$.

Derivative Tests: Critical Points & Concavity · 3

Find the local maximum value of $f(x) = x^3 - 3x - 7$.

Derivative Tests: Critical Points & Concavity · 4

Find the local minimum value of $f(x) = x^3 - 3x - 2$.

Derivative Tests: Critical Points & Concavity · 5

Find the critical numbers of $f(x) = x^3 + 3x^2 - 9x - 5$.

Derivative Tests: Critical Points & Concavity · 6

Find the critical numbers of $f(x) = x^3 - 6x^2 + 9x + 4$.

Derivative Tests: Critical Points & Concavity · 7

Find the local maximum value of $f(x) = x^3 - 3x - 9$.

Derivative Tests: Critical Points & Concavity · 8

Find the critical numbers of $f(x) = x^3 + 3x^2 - 9$.

Derivative Tests: Critical Points & Concavity · 2

ANSWER

x = 1 or x = 3

Derivative Tests: Critical Points & Concavity · 1

ANSWER

x = 0 or x = 2

Derivative Tests: Critical Points & Concavity · 4

ANSWER

-4

Derivative Tests: Critical Points & Concavity · 3

ANSWER

-5

Derivative Tests: Critical Points & Concavity · 6

ANSWER

x = 1 or x = 3

Derivative Tests: Critical Points & Concavity · 5

ANSWER

x = -3 or x = 1

Derivative Tests: Critical Points & Concavity · 8

ANSWER

x = -2 or x = 0

Derivative Tests: Critical Points & Concavity · 7

ANSWER

-7

Derivative Tests: Critical Points & Concavity · 9

Find the critical numbers of $f(x) = x^3 - 3x - 4$.

Derivative Tests: Critical Points & Concavity · 10

Find the local maximum value of $f(x) = x^3 - 3x + 8$.

Derivative Tests: Critical Points & Concavity · 11

Find the point where $f(x) = x^3 + 6x^2 + 9x + 2$ has a local minimum.

Derivative Tests: Critical Points & Concavity · 12

$f(x) = x^3 + 3x^2 - 9x$ has a critical number at $x = 1$. Use the second derivative test: is it a local maximum or a local minimum?

Derivative Tests: Critical Points & Concavity · 13

Find the inflection point of $f(x) = x^3 - 12x - 10$.

Derivative Tests: Critical Points & Concavity · 14

$f(x) = x^3 - 27x - 2$ has a critical number at $x = -3$. Use the second derivative test: is it a local maximum or a local minimum?

Derivative Tests: Critical Points & Concavity · 15

Find the point where $f(x) = x^3 - 3x^2 - 9x - 4$ has a local minimum.

Derivative Tests: Critical Points & Concavity · 16

Find the point where $f(x) = x^3 - 6x^2 + 9x - 6$ has a local minimum.

Derivative Tests: Critical Points & Concavity · 10

ANSWER

10

Derivative Tests: Critical Points & Concavity · 9

ANSWER

x = -1 or x = 1

Derivative Tests: Critical Points & Concavity · 12

ANSWER

minimum

Derivative Tests: Critical Points & Concavity · 11

ANSWER

(-1, -2)

Derivative Tests: Critical Points & Concavity · 14

ANSWER

maximum

Derivative Tests: Critical Points & Concavity · 13

ANSWER

(0, -10)

Derivative Tests: Critical Points & Concavity · 16

ANSWER

(3, -6)

Derivative Tests: Critical Points & Concavity · 15

ANSWER

(3, -31)

Derivative Tests: Critical Points & Concavity · 17

On what interval(s) is $f(x) = x^3 - 3x^2 - 24x + 4$ increasing?

Derivative Tests: Critical Points & Concavity · 18

On what interval(s) is $f(x) = x^3 - 9x^2 + 24x - 10$ decreasing?

Derivative Tests: Critical Points & Concavity · 19

Find the inflection point of $f(x) = -x^3 + 9x^2 - 15x + 6$.

Derivative Tests: Critical Points & Concavity · 20

On what interval is $f(x) = -x^3 - 3x^2 + 24x + 6$ concave up?

Derivative Tests: Critical Points & Concavity · 21

Find the local maximum value of $f(x) = -x^3 + 6x^2 + 15x - 7$.

Derivative Tests: Critical Points & Concavity · 22

Find the critical numbers of $f(x) = -x^3 + 12x + 3$.

Derivative Tests: Critical Points & Concavity · 23

On what interval(s) is $f(x) = x^3 - 6x^2 - 15x + 7$ decreasing?

Derivative Tests: Critical Points & Concavity · 24

On what interval is $f(x) = x^3 + 3x^2 + 3$ concave up?

Derivative Tests: Critical Points & Concavity · 18

ANSWER

$2 < x < 4$

Derivative Tests: Critical Points & Concavity · 17

ANSWER

$x < -2$ or $x > 4$

Derivative Tests: Critical Points & Concavity · 20

ANSWER

$x < -1$

Derivative Tests: Critical Points & Concavity · 19

ANSWER

$(3, 15)$

Derivative Tests: Critical Points & Concavity · 22

ANSWER

$x = -2$ or $x = 2$

Derivative Tests: Critical Points & Concavity · 21

ANSWER

93

Derivative Tests: Critical Points & Concavity · 24

ANSWER

$x > -1$

Derivative Tests: Critical Points & Concavity · 23

ANSWER

$-1 < x < 5$