**Task card 1** Derivative Tests: Critical Points...

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

**Task card 2** Derivative Tests: Critical Points...

On what interval(s) is $f(x) = x^3 + 3x^2 - 5$ decreasing?

**Task card 3** Derivative Tests: Critical Points...

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

**Task card 4** Derivative Tests: Critical Points...

On what interval is $f(x) = -x^3 - 9x^2 - 24x + 6$ concave up?

**Task card 5** Derivative Tests: Critical Points...

Find the local maximum value of $f(x) = -x^3 + 9x^2 - 15x - 2$.

**Task card 6** Derivative Tests: Critical Points...

Find the critical numbers of $f(x) = x^3 - 6x^2 - 15x + 3$.

**Task card 7** Derivative Tests: Critical Points...

Find the local maximum value of $f(x) = x^3 + 3x^2 - 24x - 8$.

**Task card 8** Derivative Tests: Critical Points...

On what interval(s) is $f(x) = -x^3 - 6x^2 - 9x - 1$ increasing?

**Task card 9** Derivative Tests: Critical Points...

On what interval(s) is $f(x) = 2x^3 + 6x^2 - 18x + 4$ increasing?

**Task card 10** Derivative Tests: Critical Points...

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

**Task card 11** Derivative Tests: Critical Points...

On what interval is $f(x) = x^3 - 9x^2 + 15x - 2$ concave down?

**Task card 12** Derivative Tests: Critical Points...

$f(x) = -x^3 + 12x + 4$ has a critical number at $x = 2$. Use the second derivative test: is it a local maximum or a local minimum?

**Task card 13** Derivative Tests: Critical Points...

Find the point where $f(x) = -x^3 + 12x^2 - 45x - 2$ has a local minimum.

**Task card 14** Derivative Tests: Critical Points...

Find the inflection point of $f(x) = -x^3 + 9x^2 - 24x + 7$.

**Task card 15** Derivative Tests: Critical Points...

$f(x) = -x^3 + 6x^2 + 3$ has a critical number at $x = 4$. Use the second derivative test: is it a local maximum or a local minimum?

**Task card 16** Derivative Tests: Critical Points...

On what interval(s) is $f(x) = -2x^3 + 18x^2 - 30x - 7$ decreasing?

**Task card 17** Derivative Tests: Critical Points...

On what interval(s) is $f(x) = -x^3 + 12x$ increasing?

**Task card 18** Derivative Tests: Critical Points...

On what interval(s) is $f(x) = 2x^3 - 24x^2 + 90x - 8$ decreasing?

**Task card 19** Derivative Tests: Critical Points...

On what interval is $f(x) = -x^3 - 3x^2 - 4$ concave down?

**Task card 20** Derivative Tests: Critical Points...

$f(x) = -2x^3 + 6x^2 + 48x - 6$ has a critical number at $x = 4$. Use the second derivative test: is it a local maximum or a local minimum?

**Task card 21** Derivative Tests: Critical Points...

Find the point where $f(x) = 2x^3 + 6x^2 - 48x + 10$ has a local minimum.

**Task card 22** Derivative Tests: Critical Points...

Find the inflection point of $f(x) = x^3 + 6x^2 + 9x + 7$.

**Task card 23** Derivative Tests: Critical Points...

Find the point where $f(x) = -2x^3 + 18x^2 - 48x - 9$ has a local minimum.

**Task card 24** Derivative Tests: Critical Points...

Find the inflection point of $f(x) = -2x^3 + 6x^2 + 48x - 10$.

# Derivative Tests: Critical Points & Concavity Task Cards

Recording sheet · Grade 12 · Write critical numbers like x = -1 or x = 3, points like (2, -5), and intervals as inequalities from left to right, like x < -1 or x > 3, or -1 < x < 3. For a local maximum or minimum value, give the y-value. For the second derivative test, answer maximum or minimum.

Scan to check your answers

Name: _____ Date: _____

| | | | |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 |

# Derivative Tests: Critical Points & Concavity Task Cards: Answer Key

Grade 12 · Medium

The answers online

| | | |
|---|---|---|
| **1.** -1 < x < 3 | **2.** -2 < x < 0 | **3.** (1, -4) |
| **4.** x < -3 | **5.** 23 | **6.** x = -1 or x = 5 |
| **7.** 72 | **8.** -3 < x < -1 | **9.** x < -3 or x > 1 |
| **10.** x < -4 or x > 2 | **11.** x < 3 | **12.** maximum |
| **13.** (3, -56) | **14.** (3, -11) | **15.** maximum |
| **16.** x < 1 or x > 5 | **17.** -2 < x < 2 | **18.** 3 < x < 5 |
| **19.** x > -1 | **20.** maximum | **21.** (2, -46) |
| **22.** (-2, 5) | **23.** (2, -49) | **24.** (1, 42) |