4.3: How Derivatives Affect the Shape of a Graph (Homework)

INSTRUCTOR
Francis Adjei
Texas A&M University at Galveston

Past Due **Due Date:** SAT, APR 18, 2026 11:59 PM CDT

Current Score: 20 / 20 POINTS | 100.0 %

Due date has passed. No changes can be made without an approved extension request.
You may not be granted an extension if you have already viewed the answer key.

VIEW ANSWER KEY

Scoring and Assignment Information

QUESTION	1	2	3	4	5	6	7
POINTS	2.5 / 2.5	1 / 1	3.5 / 3.5	4 / 4	1.5 / 1.5	4 / 4	3.5 / 3.5

Assignment Submission

For this assignment, you submit answers by question parts. The number of submissions remaining for each question part only changes if you submit or change the answer.

Assignment Scoring

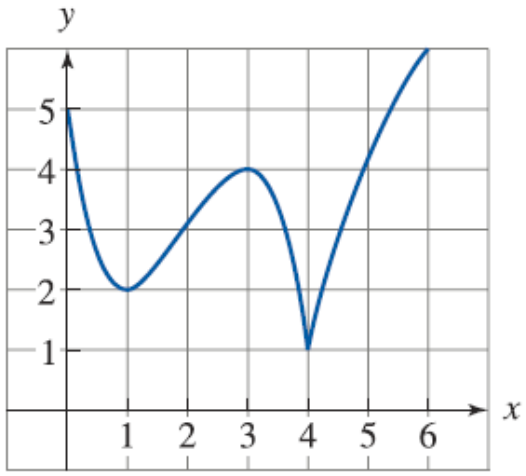
Your best submission for each question part is used for your score.

1. **[2.5 / 2.5 Points]**

DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER | PRACTICE ANOTHER

SCalcET9 4.3.001.

Consider the following graph.



(a) Find the interval(s) on which *f* is increasing. (Enter your answer using interval notation.)

$$(1,3)∪(4,6)

✔ Amazing work.

(b) Find the interval(s) on which *f* is decreasing. (Enter your answer using interval notation.)

$$(0,1)∪(3,4)

✔ Nicely done!

(c) Find the open interval(s) on which *f* is concave upward. (Enter your answer using interval notation.)

$$(0,2)

✔ That's it!

(d) Find the interval(s) on which *f* is concave downward. (Enter your answer using interval notation.)

$$(2,6)

✔ Excellent job!

(e) Find the coordinates of the point(s) of inflection.

$(x, y) =$ (

$$2, 3

✔)

Resources

Read It Watch It

2. **[1 / 1 Points]**

DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER

PRACTICE ANOTHER

SCalcET9 4.3.021.

Consider the following. (If an answer does not exist, enter DNE.)

$$f(x) = \ln(x^2 + 7)$$

Find the interval(s) on which f is concave up. (Enter your answer using interval notation.)

$$(-\sqrt{7},\sqrt{7})$$

✔ Nice work!

Find the interval(s) on which f is concave down. (Enter your answer using interval notation.)

$$(-\infty,-\sqrt{7})\cup(\sqrt{7},\infty)$$

✔ That's it!

Find the inflection points of f.

smaller x-value $(x, y) = ($ $$-\sqrt{7},\ln(14)$$ ✔ $)$

larger x-value $(x, y) = ($ $$\sqrt{7},\ln(14)$$ ✔ $)$

Resources

Read It

3. **[3.5 / 3.5 Points]**

DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER | PRACTICE ANOTHER

SCalcET9 4.3.027.

Consider the equation below. (If an answer does not exist, enter DNE.)

$$f(x) = xe^{4x}$$

(a) Find the interval on which f is increasing. (Enter your answer using interval notation.)

$$(-14,\infty)$$

✔ Terrific!

Find the interval on which f is decreasing. (Enter your answer using interval notation.)

$$(-\infty,-14)$$

✔ That's right!

(b) Find the local maximum and minimum values of f.

local minimum value $$-14e$$

✔ Great job.

local maximum value $$DNE

✔ Impressive work.

(c) Find the inflection point.

$(x, y) =$ (

$$-12,-12e2$$

✔)

Find the interval on which f is concave up. (Enter your answer using interval notation.)

$$(-12,\infty)$$

✔ Fantastic work!

Find the interval on which f is concave down.(Enter your answer using interval notation.)

$$(−∞,−12)

Awesome job!

Resources

Read It

4. **[4 / 4 Points]**

DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER | PRACTICE ANOTHER

SCalcET9 4.3.024.

Consider the equation below. (If an answer does not exist, enter DNE.)

$$f(x) = \frac{x}{x^2 + 9}$$

(a) Find the interval on which f is increasing. (Enter your answer using interval notation.)

$$(-3,3)

✔ Outstanding!

Find the interval on which f is decreasing. (Enter your answer using interval notation.)

$$(-\infty,-3)\cup(3,\infty)

✔ Nice job!

(b) Find the local maximum and minimum values of f.

local minimum value $$-16

✔ Very nice!

local maximum value $$16

✔ Good work!

(c) Find the inflection points. (Order your answers from smallest to largest x, then from smallest to largest y.)

(x, y) = (

$$-3\sqrt{3},-\sqrt{312}

✔)

$(x, y) = ($

$$0,0

✔)

$(x, y) = ($

$$3√3,√312

✔)

Find the interval on which *f* is concave up. (Enter your answer using interval notation.)

$$(−3√3,0)∪(3√3,∞)

✔ You're right!

Find the interval on which *f* is concave down.(Enter your answer using interval notation.)

$$(−∞,−3√3)∪(0,3√3)

✔ Nice job.

Resources

Read It

5. **[1.5 / 1.5 Points]**

DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER | PRACTICE ANOTHER

SCalcET9 4.3.022.

Consider the following. (If an answer does not exist, enter DNE.)

$$f(x) = \frac{e^x}{e^x + 4}$$

Find the interval(s) on which f is concave up. (Enter your answer using interval notation.)

$$(-\infty, \ln(4))$$

✔ Nice!

Find the interval(s) on which f is concave down. (Enter your answer using interval notation.)

$$(\ln(4), \infty)$$

✔ Amazing work!

Find the inflection point of f.

$(x, y) =$ $$\left(\ln(4), 12\right)$$

✔

Resources

Read It

6. **[4 / 4 Points]**

DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER | PRACTICE ANOTHER

SCalcET9 4.3.028.

Consider the equation below. (If an answer does not exist, enter DNE.)

$$f(x) = 5\cos^2(x) - 10\sin(x), \quad 0 \le x \le 2\pi$$

(a) Find the interval on which f is increasing. (Enter your answer using interval notation.)

$$(\pi 2, 3\pi 2)$$

✔ Nice job!

Find the interval on which f is decreasing. (Enter your answer using interval notation.)

$$(0, \pi 2) \cup (3\pi 2, 2\pi)$$

✔ That's great!

(b) Find the local minimum and maximum values of f.

local minimum value $$-10

✔ Nice work.

local maximum value $$10

✔ That's great!

(c) Find the inflection points. (Order your answers from smallest to largest x, then from smallest to largest y.)

$(x, y) =$ ($$\pi 6, -54) ✔

$(x, y) =$ ($$5\pi 6, -54) ✔

Find the interval on which *f* is concave up. (Enter your answer using interval notation.)

$$(π6,5π6)

✔ Great!

Find the interval on which *f* is concave down. (Enter your answer using interval notation.)

$$(0,π6)∪(5π6,2π)

✔ Fantastic job!

Resources

Read It Watch It

7. **[3.5 / 3.5 Points]**

DETAILS | MY NOTES | PREVIOUS ANSWERS | ASK YOUR TEACHER | PRACTICE ANOTHER

SCalcET9 4.3.026.

Consider the equation below. (If an answer does not exist, enter DNE.)

$$f(x) = x^5 \ln(x)$$

(a) Find the interval on which f is increasing. (Enter your answer using interval notation.)

$$(e^{-1/5}, \infty)$$

✔ Good work.

Find the interval on which f is decreasing. (Enter your answer using interval notation.)

$$(0, e^{-1/5})$$

✔ Impressive work!

(b) Find the local minimum and maximum values of f.

local minimum value $-15e$

✔ Nice work!

local maximum value DNE

✔ Impressive work!

(c) Find the inflection point.

$(x, y) =$ (

$$e^{-9/20}, -920e^{9/4}$$

✔)

Find the interval on which f is concave up. (Enter your answer using interval notation.)

$$(e^{-9/20}, \infty)$$

✔ Great work!

Find the interval on which f is concave down. (Enter your answer using interval notation.)

$$(0,e-9/20)

Fantastic job!

Resources

Read It

Home My Assignments