

# 3.1: Derivatives of Polynomials and Exponential F (Homework)

 INSTRUCTOR

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Past Due **Due Date: FRI, FEB 13, 2026 11:59 PM CST**

**Current Score: 8 / 20 POINTS | 40.0 %**

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	8	9	10
POINTS	1 / 1	2 / 2	2 / 2	1 / 2	2 / 2	- / 4	- / 1	- / 2	- / 2	- / 2

### 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. [1 / 1 Points]

DETAILS

MY NOTES

PREVIOUS ANSWERS

ASK YOUR TEACHER

PRACTICE ANOTHER

S<sub>Calc</sub>ET9 3.1.008.

Differentiate the function.

$$F(t) = t^9 + e^9$$

$F'(t) =$   
\$9t<sup>8</sup>

✓ Amazing job!

#### Resources

[Read It](#)

### 2. [2 / 2 Points]

DETAILS

MY NOTES

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ASK YOUR TEACHER

PRACTICE ANOTHER

S<sub>Calc</sub>ET9 3.1.017.

Differentiate the function.

$$g(x) = \frac{1}{\sqrt{x}} + \sqrt[5]{x}$$

$g'(x) =$   
\$-12x<sup>-3/2</sup> + 15x<sup>-4/5</sup>

✓ Exactly!

#### Resources

[Read It](#)

3. [2 / 2 Points]

DETAILS

MY NOTES

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ASK YOUR TEACHER

PRACTICE ANOTHER

SCalcET9 3.1.059.

Find the points on the curve  $y = x^3 + 3x^2 - 9x + 2$  where the tangent is horizontal.

smaller x-value

$(x, y) =$

$($   
-3, 29

✓ )

larger x-value

$(x, y) =$

$($   
1, -3

✓ )

Resources

[Read It Watch It](#)

4. [1 / 2 Points]

DETAILS

MY NOTES

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ASK YOUR TEACHER

PRACTICE ANOTHER

S<sub>Calc</sub>ET9 3.1.055.

Biologists have proposed a cubic polynomial to model the length  $L$  of Alaskan rockfish at age  $A$ :

$$L = 0.0155A^3 - 0.372A^2 + 3.95A + 1.21,$$

where  $L$  is measured in inches and  $A$  in years. Calculate  $\left. \frac{dL}{dA} \right|_{A=12}$ . (Round your answer to three decimal places.)

$$\left. \frac{dL}{dA} \right|_{A=12} = \boxed{\text{(No Response)}} \text{ in/yr}$$

Interpret your answer.

- A 12-year old rock fish grows at a rate of 1.718 in/yr.
- A 12-year old rock fish shrinks at a rate of 1.718 in/yr.
- A 12-year old rock fish shrinks at a rate of 44.332 in/yr.
- A 12-year old rock fish grows at a rate of 42.614 in/yr.
- A 12-year old rock fish grows at a rate of 44.332 in/yr.



Great job!

**Resources**

[Read It](#)

5. [2 / 2 Points]

DETAILS

MY NOTES

PREVIOUS ANSWERS

ASK YOUR TEACHER

PRACTICE ANOTHER

S<sub>Calc</sub>ET9 3.1.024.

Differentiate the function.

$$y = \frac{3\sqrt{x} + 5x}{8x^2}$$

$y' =$

916x<sup>-5</sup> - 58x<sup>-2</sup>

✓ Great work.

Resources

[Read It](#)

6. [- / 4 Points]

DETAILS

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

S<sub>Calc</sub>ET9 3.1.054.

The equation of motion of a particle is  $s = t^4 - 5t^3 + t^2 - t$ , where  $s$  is in meters and  $t$  is in seconds. (Assume  $t \geq 0$ .)

- (a) Find the velocity,  $v(t)$ , and acceleration,  $a(t)$ , as functions of  $t$ .

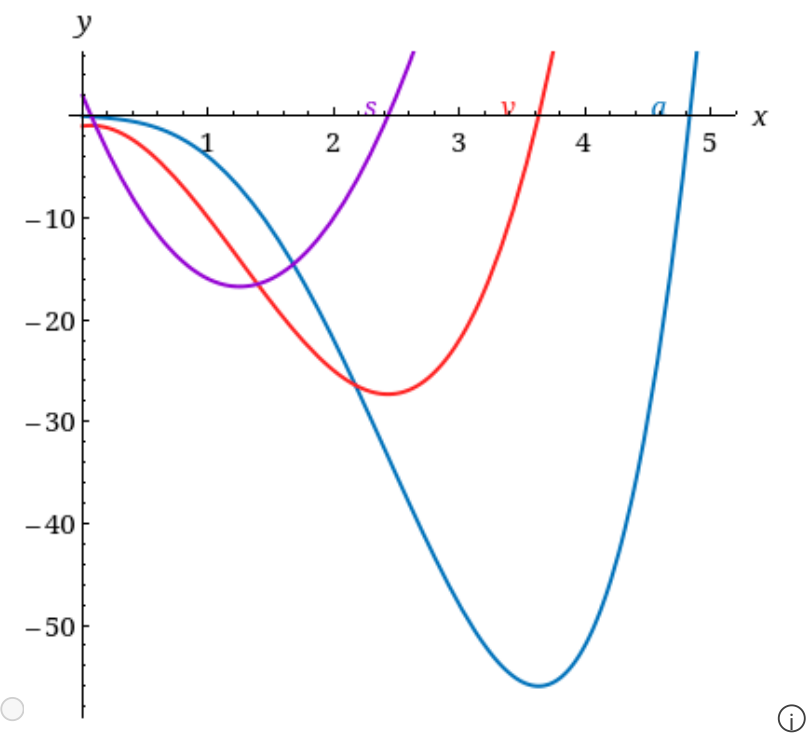
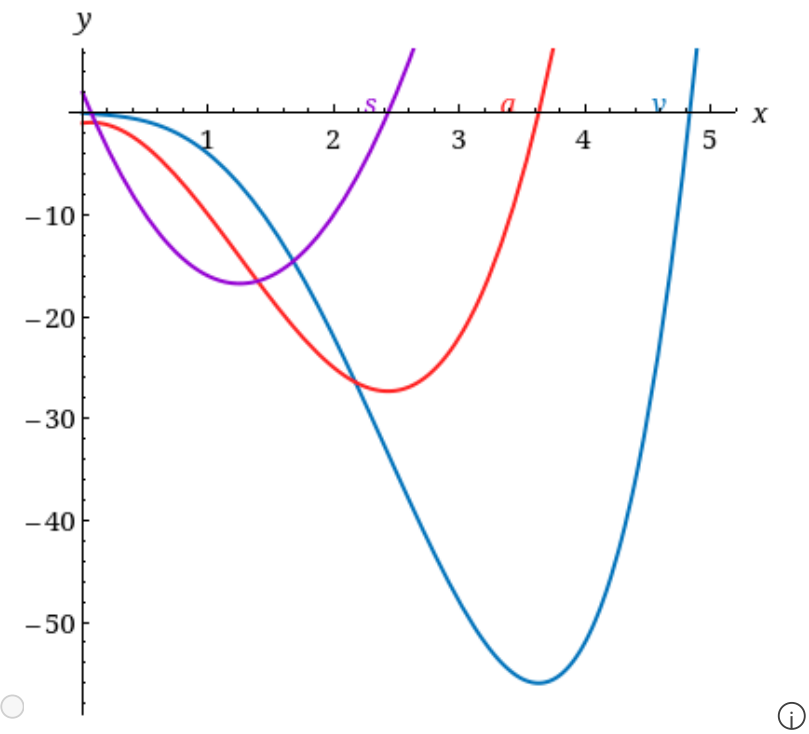
$$v(t) = \boxed{\text{(No Response)}}$$

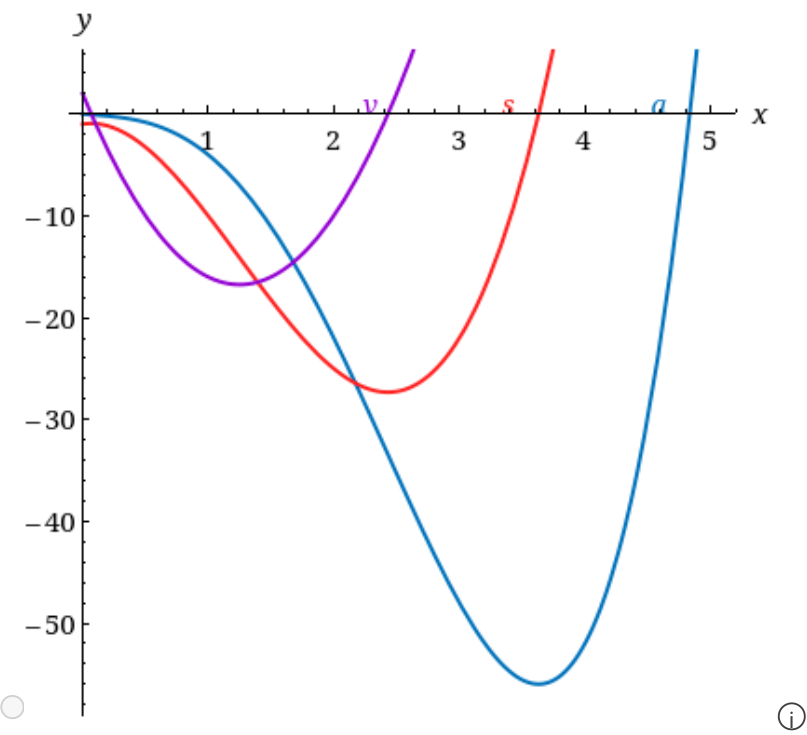
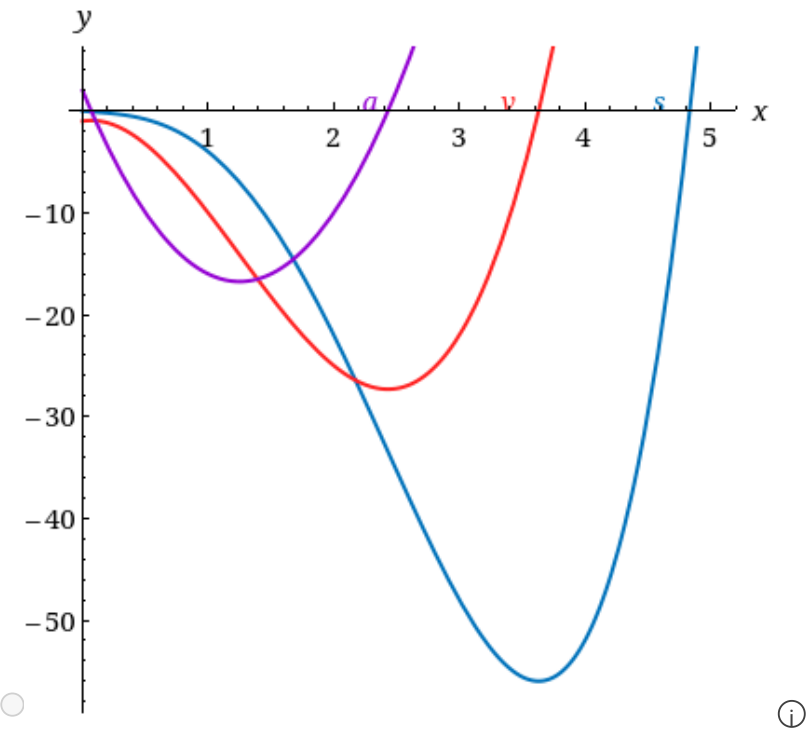
$$a(t) = \boxed{\text{(No Response)}}$$

- (b) Find the acceleration (in  $\text{m/s}^2$ ) after 1.3 s.

$$a(1.3) = \boxed{\text{(No Response)}} \text{ m/s}^2$$

- (c) Graph the position, velocity, and acceleration functions on the same screen.





### Resources

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7. [- / 1 Points]

DETAILS

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

SCalcET9 3.1.013.

Differentiate the function.

$$s(t) = \frac{1}{t} + \frac{1}{t^5}$$

$s'(t) =$

**Resources**[Read It](#)

8. [- / 2 Points]

DETAILS

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

SCalcET9 3.1.085.

Find the values of  $m$  and  $b$  that make  $f$  differentiable everywhere.

$$f(x) = \begin{cases} x^2 & \text{if } x \leq 8 \\ mx + b & \text{if } x > 8 \end{cases}$$

$m =$

$b =$

**Resources**[Read It](#)

9. [- / 2 Points]

DETAILS

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

SCalcET9 3.1.086.

Find numbers  $a$  and  $b$  such that the given function  $g$  is differentiable at 1.

$$g(x) = \begin{cases} ax^3 - 3x & \text{if } x \leq 1 \\ bx^2 + 9 & \text{if } x > 1 \end{cases}$$

$a =$

$b =$

**Resources**[Read It](#)

10. [- / 2 Points]

DETAILS

MY NOTES

ASK YOUR TEACHER

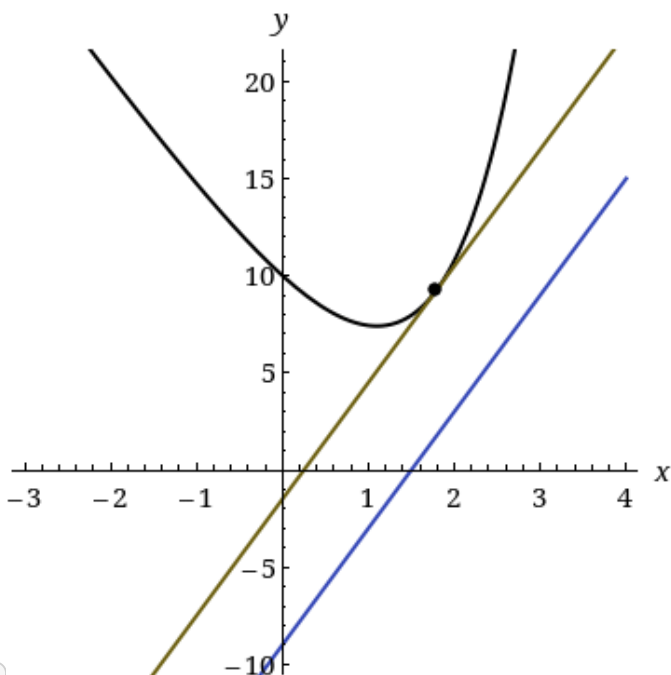
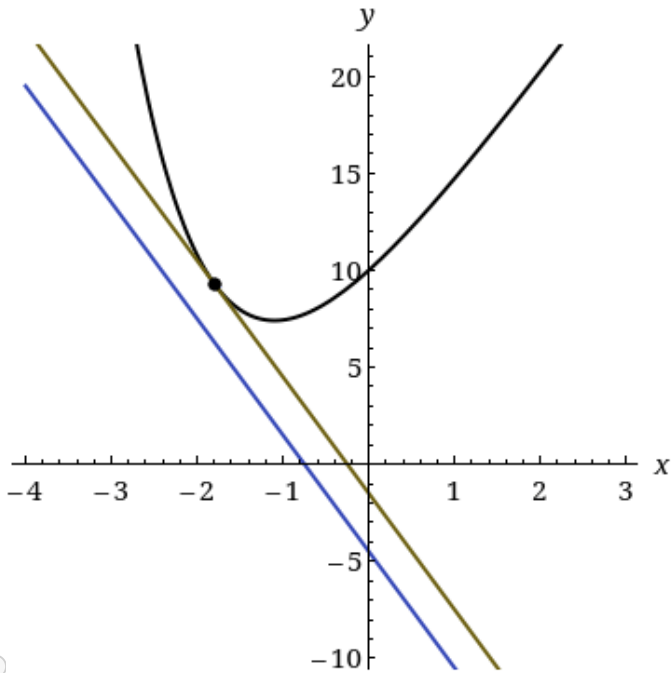
PRACTICE ANOTHER

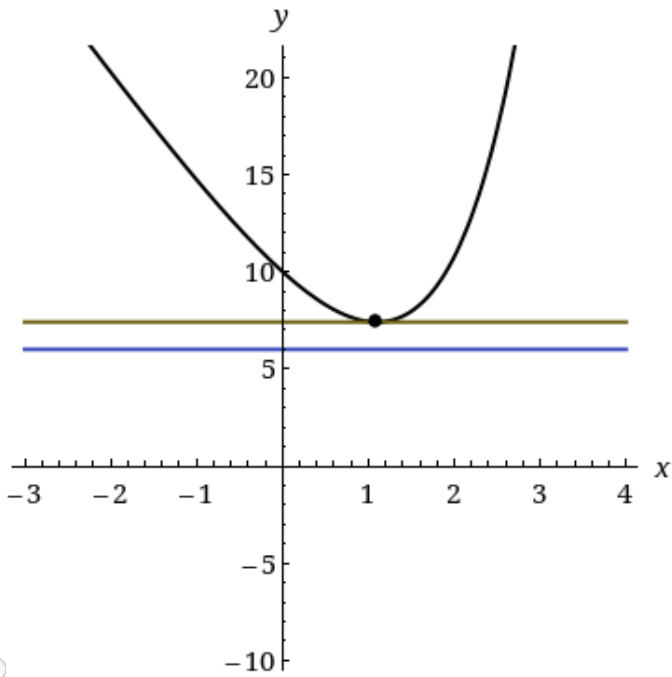
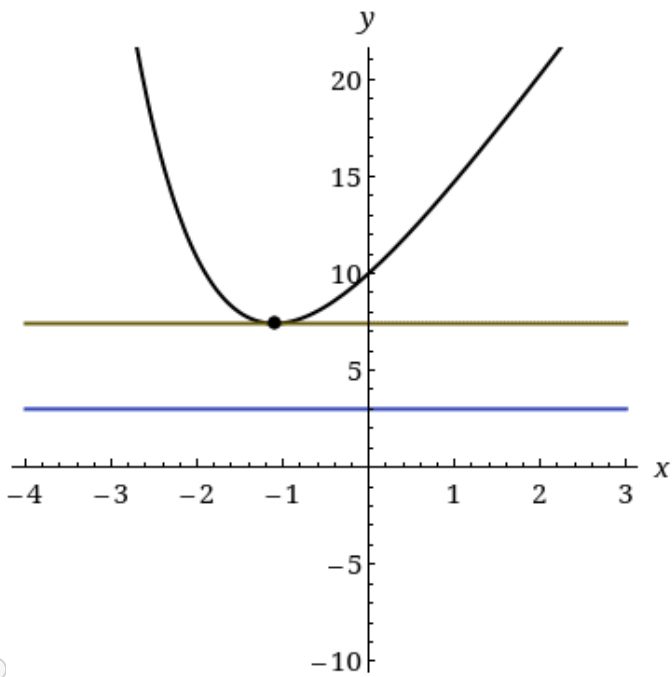
S<sub>CalcET9</sub> 3.1.064.

At what exact point on the curve  $y = 8 + 2e^x - 6x$  is the tangent line parallel to the line  $6x - y = 9$ ?

$(x, y) = \left( \boxed{\text{(No Response)}} \right)$

Illustrate by graphing the curve and both lines.





### Resources

[Read It](#)

[Home](#) [My Assignments](#)

