

Math 122 Team 2 001 Extra Credit Exercises

Seth Boone

Quotient Rule

Function: $f(x) / g(x)$

Derivative: $[\{f'(x) * g(x)\} - \{f(x)*g'(x)\}] / g(x)^2$

- 1) Find the derivative of $(2 - x^3) / (3x^2)$. You do not need to simplify your answer.
- 2) Given that $f(1) = 1$, $f'(1) = 2$, $g(1) = -2$, $g'(1) = 3$, find the derivative of $f(x)/g(x)$ at $x = 1$.

Gregory Chonko

D7 and D8

D7: When $f(x) = e^x$, $f'(x) = e^x$

D8: When $f(x) = a^x$, $f'(x) = a^x * \ln(a)$

Differentiate the following using the rules listed above:

1. $f(x) = 3e^x$
2. $f(x) = 2 - 4e^x$
3. $f(x) = 2 * 7^x$

Alexi Hildreth

D10 pt. 2: if $f(x) = e^{g(x)}$ then $f'(x) = g'(x) * e^{g(x)}$

Differentiate the following:

1. $f(x) = e^{(x^2 + 4)}$
2. $f(x) = e^{(3x^4 - 6x + 8)}$

Allison Hoelker

Power Rule $f(x) = x^n$ $f'(x) = nx^{(n-1)}$

Differentiate the following:

1. $f(x) = x^7 + 3x^3$
2. $f(x) = 3/x^2 + x^{1/2} - 4x^{(3/2)}$

Matthew Lorenz

D10 (part 3)

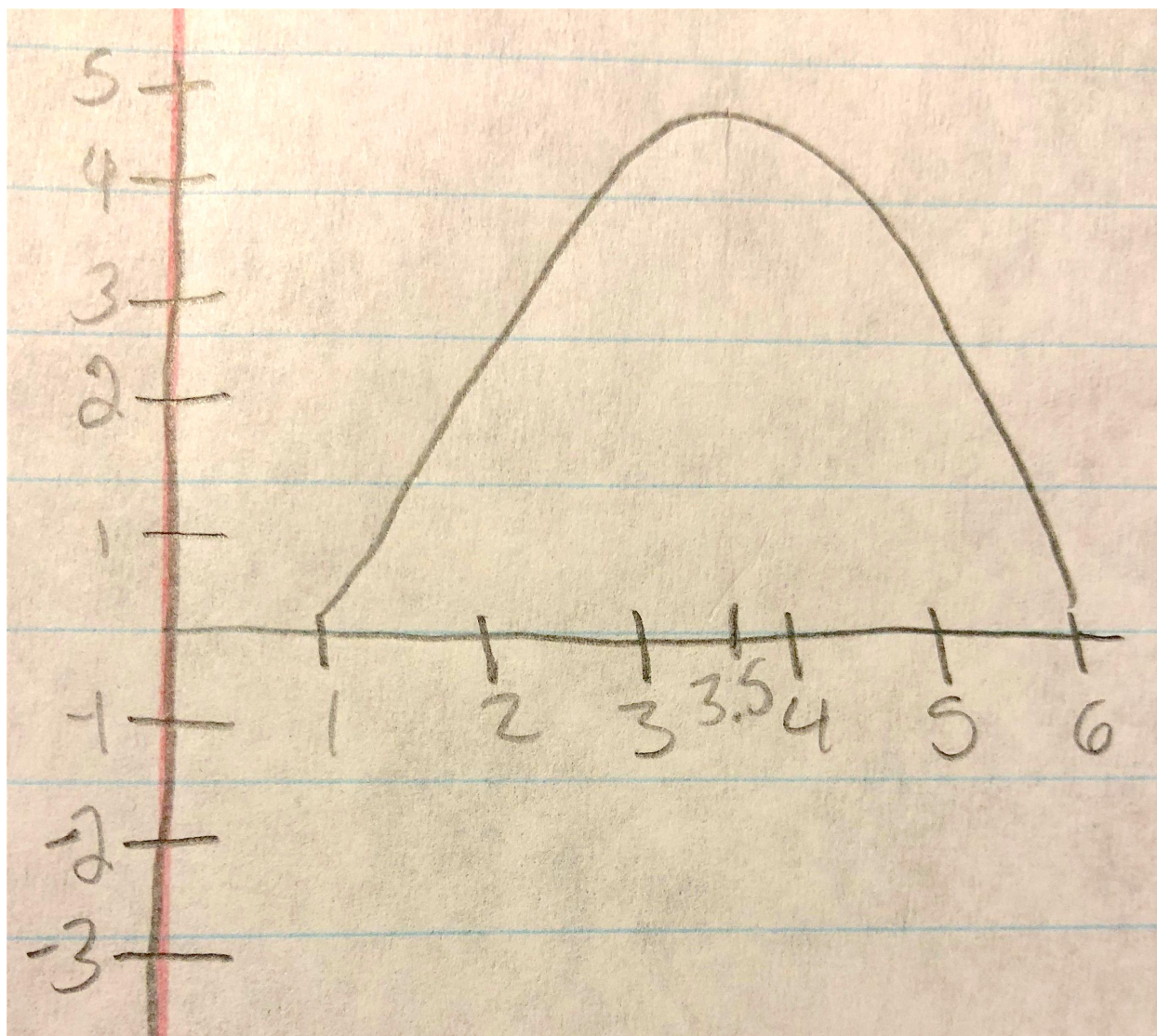
If $f(x) = \ln g(x)$ then $f'(x) = g'(x) / g(x)$

Examples: Find the derivative.

- 1) $f(x) = \ln (2x^5 + 1)$
- 2) $f(x) = \ln (4x^3 + 2^x - e^x)$

Kayla McCarthy

Finding the derivative of a function graphically and finding the equation of a tangent line.



1) If the graph of $y = f(x)$ is as shown above, estimate $f'(3.5)$

To find the equation of the tangent line at a specific point on a graph follow these steps:

- *Find the derivative of the function.
- *Substitute the x-value given into the derivative of the function to get the slope.
- *Plug in the (x,y) coordinates and the slope into the general point-slope form. (If only x is given, substitute x into the given function to find y.)
- *Solve for y to get the slope-intercept form.

Using the steps above, find the equation of the tangent line in slope-intercept form at the point, or x value, indicated:

2) $f(x) = 10x^3 + 3x^2 + 4$ at (1,17)

3) $f(x) = 6x^4 + 7x^2 - 8$ when $x = -1$

Elliott Reed

Rule D9: The derivative of $f(x) = \ln(x)$ is $f'(x) = 1/x$

Differentiate the following:

- 1) $f(x) = 2\ln(x) - 3$
- 2) $f(x) = \ln(e^x) - e \cdot \ln(x)$

Emma Kate Rhymer

D10 part 1

Function: $f(x)^n$

Derivative: $n \cdot f(x)^{n-1} \cdot f'(x)$

Differentiate the following:

- 1) $(6x^2 - 2x + 6)^{22}$
- 2) $(20x^8 - 2e^x)^{11}$

Lydia Smith

(D2 and D3, addition and subtraction rules)

D2: $f(x) + g(x)$ becomes $f'(x) + g'(x)$

- 1) Take the derivative of $8x^2 + 12x$
- 2) Take the derivative of $9x^5 + x^2$

D3: $f(x) - g(x)$ becomes $f'(x) - g'(x)$

Differentiate the following:

- 1) $3x^3 - 7x$
- 2) $15p^2 - 6p$

Tyler Susong

Product Rule: $u'v + uv'$

Differentiate the following

- 1) $(x^3 - 2x)(x^2 + 4x)$

2) $(2x^2 - 3) \cdot e^x$

Tara Weaver

Rules D1, D4, and D5

D1: When $f(x) = c$, $f'(x) = 0$

D4: When $h(x) = C \cdot f(x)$, $h'(x) = C \cdot f'(x)$

D5: When $h(x) = x$, $h'(x) = 1$

Using the rules listed above differentiate the following:

1) $f(x) = 56$

2) $f(x) = 3x$

3) $f(x) = 3x + 56$