

Find the derivative of the following functions: and answer the questions.

1. $f(x) = (x^2 + 3x + 4)^{20}$

2. $f(x) = 30e^{3x+1}$

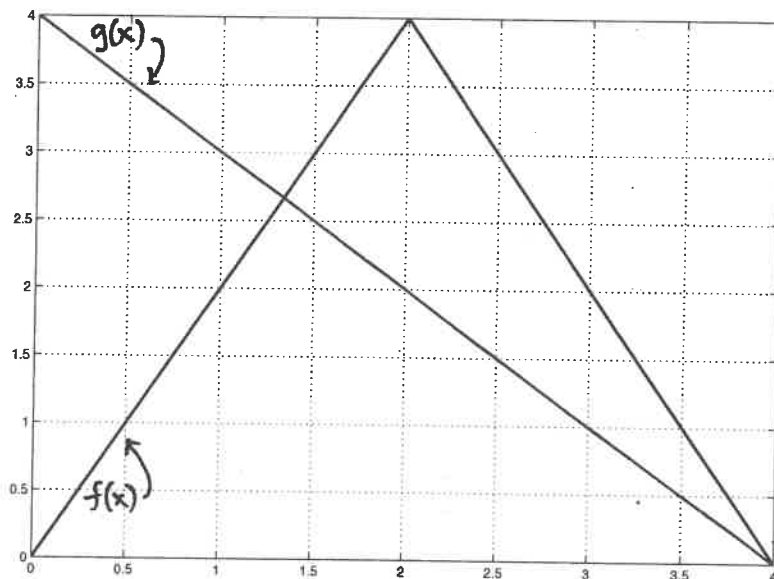
3. $f(x) = \frac{\sqrt{x}}{e^x}$

4. $f(x) = e^x(4x^2 + x)^3$

For each: Is the function increasing or decreasing at $x=1$? Is the function concave up or down at $x=1$? Explain how you know this.

#5 If $h(x) = f(g(x))$, from looking at the figure below, and using the product rule, find:

$h'(1)$, $h'(2)$, and $h'(3)$. Explain how you figured this out.



Find the derivative of the following functions using all the rules we have so far.

#6 $f(x) = e^x \sin(3x^2)$

#7 $f(x) = e^{-\cos(2x)}$

#8 $p(\theta) = 2 \tan(3\theta)$

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