

Show work for partial credit.

1.  $f(x) = x^4e^{2x}$ . Find  $f''(x)$  and simplify.

2. The resale value of  $R$  (in dollars) of a company car after  $t$  years is estimated to be  $R(t) = 20,000e^{-0.15t}$ . What is the rate of depreciation (in dollars per year) after 2 years?

3. Where is the function  $f(x) = \ln(x^2 + 4)$  concave down? Justify your answer and express it as an interval.

4. Find  $y'$  and the slope of the tangent line to the graph of  $(y - 3)^4 - x = y$  at the point  $(-3, 4)$ .