



5. (2, probl. 25-40) Find derivatives to the following functions:

a)  $f(x) = \frac{3}{\sqrt{x}} + \frac{5}{x^2}$

b)  $f(t) = t^2(t + 2)^3$

c)  $f(x) = x^2 \sin x$

d)  $f(x) = \sin x^2$

e)  $f(x) = \tan \sqrt{x}$

f)  $f(x) = (2e^{-x})^2$

g)  $f(x) = \sqrt{\ln x + 1}$ .

6. (2, probl. 55) Find  $f^{(26)}(x)$  for  $f(x) = \sin 3x$ .

7. (2, probl. 56) Find  $f^{(31)}(x)$  for  $f(x) = e^{-2x}$ .

8. (2, probl. 69) Find all points at which the tangent line to the curve  $x^2 - 4y = x^2$  is (a) horizontal, (b) vertical.

9. (2, probl. 74) Find all values in  $[0, 2]$  as guaranteed by the Mean Value Theorem for  $f(x) = x^3 - x$ .