

**Answers to Problems from section 3.6:**

6.  $\frac{2xy(e^{x^2} - y^2)}{5y^4 + 3x^2y^2 - e^{x^2}}$

10.  $\frac{\sin(y^2) - 2xy \cos(x^2)}{\sin(x^2) - 2xy \cos(y^2)}$

11.  $\frac{y(y - e^{x/y})}{y^2 - xe^{x/y}}$

13.  $f'(1) = -\frac{16}{13}$

17.  $y = x + \frac{1}{2}$

29.  $\frac{1}{2\sqrt{x}(1+x)}$

31.  $\frac{1}{\sqrt{-x^2 - x}}$

39. Two points of intersection (1, 1) and (1, -1). Slopes of tangent lines are -2 and  $\frac{1}{2}$ .

**Answers to Problems from section 3.7:**

4.  $\frac{-\sin(\ln x)}{x}$

8.  $\frac{x+1}{x \ln 5}$

13.  $\frac{1 + \ln 2}{u[1 + \ln(2u)]^2}$

15.  $\frac{10x+1}{5x^2+x-2}$

22.  $f'(x) = \frac{1}{\ln \ln x} \cdot \frac{1}{\ln x} \cdot \frac{1}{x}$

Domain( $f$ ) =  $\{x \mid \ln \ln x > 0\} = \{x \mid \ln x > 1\} = \{x \mid x > e\} = (e, \infty)$ .

31.  $y' = x^x(1 + \ln x)$

$$36. (\sin x)^{\ln x} \left( \ln x \cot x + \frac{\ln \sin x}{x} \right)$$

$$38. \frac{\ln y - y/x}{\ln x - x/y}$$

**Answers to Problems from section 3.8:**

$$5. L(x) = f(-1) + f'(-1)(x - (-1)) = -10x - 6.$$

$$10. \sqrt[3]{0.95} \approx 1 + \frac{1}{3}(-0.05) = .98\bar{3} \text{ and } \sqrt[3]{1.1} \approx 1 + \frac{1}{3}(0.1) = 1.0\bar{3}$$

$$14. -0.483 < x < 0.416.$$

$$25. (a) dy = \frac{1}{10} e^{1/10} dx$$

$$(b) dy = 0.01, \text{ so } \Delta y = f(x + \Delta x) - f(x) \approx 0.0101$$

$$27. (a) \text{Relative error: } 0.01, \text{ Percentage error: } 1\%.$$

$$(b) \text{Relative error: } 0.00\bar{6}, \text{ percentage error: } 0.\bar{6}\%.$$