

Chapter 3T Form A

1. -3 and 1

2. 0, 5, and -5

3. a.

$$\begin{array}{ccccccccc} f' > 0 & f' = 0 & f' < 0 & f' = 0 & f' > 0 & & & & \\ \hline & x=1 & & x=3 & & & & & \\ \swarrow & \rightarrow & \searrow & \rightarrow & \swarrow & & & & \rightarrow \end{array}$$

b. $\frac{f'' < 0 \quad f'' = 0 \quad f'' > 0}{\text{concave down} \quad x=2 \quad \text{concave up}}$

c. maximum at (1, 3), minimum at (3, -1), point of inflection at (2, 1)

4. a. $\frac{f' < 0 \quad f' = 0 \quad f' > 0 \quad f' = 0 \quad f' > 0}{\swarrow \quad \rightarrow \quad \searrow \quad \rightarrow \quad \swarrow}$

b. $\frac{f'' > 0 \quad f'' = 0 \quad f'' < 0 \quad f'' = 0 \quad f'' > 0}{\text{concave up} \quad x=1 \quad \text{concave down} \quad x=3 \quad \text{concave up}}$

c. minimum at (0, 0) points of inflection at (1, 11) and (3, 27)

5. Maximum of f is 30.375 at $x = 2.5$
Minimum of f is -4 at $x = 0$ 6. proportion is $\frac{1}{3}$ 7. 2000 ft²

8. \$ 6923

9. $\frac{dy}{dx} = \frac{-x-2y}{2x+y}$

10. $\frac{dy}{dx} = -0.25$

11. a. $2.5x + 1.5 + \frac{40}{x}$

b. 4 units

c. \$21.50

12. \$ 17.50

13. run size: 20,000; 2 runs per year

Chapter 4T Form A

1. $\frac{10x}{x^2+1}$
2. $e^{x^2}(3x^2+2x^4)$
3. $\frac{3}{3x+1} - \frac{4}{3}e^{\frac{x}{3}}$
4. $\frac{-xe^x}{\sqrt{6-x^2}} + e^x\sqrt{6-x^2}$
5. $\frac{2x-5}{x^2-5x+3} - \frac{12}{4x+7}$
6. ex^{e-1}
7. $2e^2$
8. a. increasing by \$2,775 / year
b. increasing by \$5875 / year
9. 0.055
10. 3: elastic
11. elasticity of demand = $\frac{1}{3}$ (inelastic); she should raise the price to increase revenue
12. \$55,607
13. \$ 0.30
14. (e^3, e^3)
15. 15.4%
16. \$811.91
17. $x = -1$
18. a. 10,000
b. 13,075
19. 17.8%
20. $\ln x$