

Lesson 6.1.2

6-17. See below:

a. $y = 2^x, x^2 + y^2 = 1$

6-18. $a = e$

6-19. See below:

a. $x = \frac{1+\ln 5}{2}$

b. \ln and e are inverse functions.

6-20. See below:

a. $y = e^{x \ln 2}$

b. $\frac{dy}{dx} = \ln 2 e^{x \ln 2}$

c. $\frac{dy}{dx} = (\ln 2) 2^x$

d. $\frac{d}{dx}(a^x) = (\ln a)a^x$

6-21. See below:

a. $5^x \ln 5$

b. $3 \ln 7 \cdot 7^x$

c. 5^x

6-22. See below:

a. $f'(x) = 2 \ln(3)3^{2x} + \ln(3)3^x - 1$

b. $y' = 3x^3 \ln(2)2^{x^3} \tan x + 2^{x^3} \tan x \sec x$

c. $g'(x) = -\csc x \cot x \cdot e^{\csc x} + 2 \ln(5)5^{2x}$



6-23. Let x = the number of \$2 decreases in price. The profit is $P(x) = (36 - 2x)(23 + 5x)$. The maximum profit occurs when $x = 6.7$. The maximum profit is \$1276.90 per week when the price is \$85.64 per stereo.

6-24. See below:

- a. $2t \cdot f'(t^2)$
- b. $h(x) + xh'(x)$
- c. $h(t^2) + 2t^2h'(t^2)$

6-25. See below:

- a. $8 \cdot 2^x$
- b. Yes, 8 is the proportionality constant.
- c. $\frac{3^x}{9}, 625 \cdot 5^x$
- d. No

6-26. See below:

- a. $e^x(\sin x + \cos x)$
- b. $-15(3z - 2)^{-2}$
- c. $\cos t$

6-27. See below:

- a. 29.375 un^2
- b. $\int_{-3}^2 (3x^2 - 2)dx = 25 \text{ un}^2$

6-28. See below:

- a. x^2
- b. \sqrt{x}
- c. $\frac{5x}{2}$

d. $\ln 5 + x$

6-29. See below:

a. $x = 0$; cusp

b. $a = 2, b = 1$