Lesson 6.1.3

6-30. See below:

a. e^x

b. $(\ln 7)(7^x)$

c. $3e$

d. $21 \ln 7$

6-31. $\cos(x)$ is inside of 3^x

6-32. See below:

a. $3 \cos(3x)$

b. $(\ln 5)(5^x)$

c. $e^{3x}(1 + 3x)$

d. $-(\ln 5)(\sin x)(5^{\cos x})$

e. $(\ln 3)(3^x) \cos(3^x)$

f. $(ex^{2-5})(3x^2 + 2x^4)$

g. $-(\ln 2)(\csc^2 x)(2^{\cot x})$

h. $e^{\tan x} \sec^2 x$

i. $-6(\ln 2)(\csc^2 x)(2^{\cot x})$

j. $(\ln 10)(\sec x \tan x - \csc x \cot x) \cdot (10^{\sec x + \csc x})$

6-33. $V = 1.10^t$, $V' = \ln(1.10)1.10^t$, $V'(10) \approx 25¢$ per year

Review & Preview

6-34. See below:

a. 1.647% and 1.691%; Nearly the same, so yes.

b. Answers will vary, depending on assumed growth rate and starting year. One model is $33.765(1.01669)^t$ where t is years since 2000.

c. About 47.015 million

d. ≈ 573,000 people

e. The approximate population growth during a year is the starting population multiplied by a constant growth factor or "multiplier." In this situation, the multiplier is ≈ 0.0167.

6-35. See below:

a. $\frac{6^x}{\ln 6} - 3\sec x + C$

b. $\frac{64}{15}\pi$

c. 16.5

d. $-\frac{18}{\sqrt[3]{m}} + C$

6-36. At $x = 0$ because the slopes on both sides do not agree.

6-37. See below:

a. Two hemispheres connected by a smaller cylinder.

b. 315π un^3

6-38. See below:

a. 1

b. $(\ln 10)10^x \sec^2 10^x$

c. $\cos t$

d. $(\sec^2 e^x)e^x$

e. $-(3\ln 2)w^2 \sin(w^3)2^{\cos(w^3)}$

6-39. See below:

a. Velocity is the antiderivative of acceleration.

b. $v(t) = -32t + 120$

c. $s(t) = -16t^2 + 120t + 100$

d. –144 ft/sec

e. 325 ft

f. $t \approx 8.258$ ft

6-40. No; graph can have a cusp.