Student: Cole Lamers **Date:** 10/19/19	**Instructor:** Viktoriya Shcherban **Course:** Calc 1 11:30 AM / Internet (81749&81750) Shcherban	**Assignment:** 7.3 Exponential Functions (Set 1)

1. Solve for t.

a. $e^{-0.2t} = 81$ **b.** $e^{kt} = \frac{1}{2}$ **c.** $e^{(\ln 0.3)t} = 0.4$

a. t = $-\frac{\ln 81}{.2}$ (Type an exact answer.)

b. t = $\frac{\ln .5}{k}$ (Type an exact answer.)

c. t = $\frac{\ln .4}{\ln .3}$ (Type an exact answer.)

2. Find the derivative of y with respect to x if y = e^{-3x}.

The derivative of y with respect to x if y = e^{-3x} is $-3e^{-3x}$.

3. Find the derivative of y with respect to x.

$y = e^{3-2x}$

$\frac{dy}{dx} = -2e^{3-2x}$

4. Find the derivative of y with respect to x.

$y = 24x\,e^{6x} - 4e^{6x}$

$\frac{dy}{dx} = 144e^{6x}x$

5. Find the derivative of y with respect to x if y = $\left(4x^2 - 8x + 8\right)e^x$.

The derivative of y with respect to x if y = $\left(4x^2 - 8x + 8\right)e^x$ is $4e^x x^2$.

6. Find the derivative of y with respect to θ if y = $e^{3\theta}(\cos(3\theta) + \sin(3\theta))$.

The derivative of y with respect to θ for y = $e^{3\theta}(\cos(3\theta) + \sin(3\theta))$ is $6e^{3\theta}\cos(3\theta)$.

7. Find the derivative of the given function.

$y = \cos\left(e^{-4\theta^3}\right)$

$\frac{dy}{d\theta} = 12e^{-4\theta^3}\theta^2 \sin\left(e^{-4\theta^3}\right)$

8. Find the derivative of y with respect to t.

$y = \ln\left(6t\,e^{-2t}\right)$

$\frac{dy}{dt} = \frac{1-2t}{t}$

9. Find the derivative of y with respect to θ if $y = \ln\left(\frac{e^{9\theta}}{1+e^{9\theta}}\right)$.

The derivative of y with respect to θ if $y = \ln\left(\frac{e^{9\theta}}{1+e^{9\theta}}\right)$ is $\frac{9}{1+e^{9\theta}}$.

10. Find $\frac{dy}{dt}$ for $y = e^{\cos^2(\pi t-4)}$.

Choose the correct derivative of the function.

- A. $\frac{dy}{dt} = -2\pi \sin^2(\pi t-4)\, e^{\cos^2(\pi t-4)}$
- B. $\frac{dy}{dt} = \pi \sin^2(\pi t-4)\, e^{\cos^2(\pi t-4)}$
- C. $\frac{dy}{dt} = \pi \cos(\pi t-4) \sin(\pi t-4)\, e^{\cos^2(\pi t-4)}$
- D. $\frac{dy}{dt} = -2\pi \cos(\pi t-4) \sin(\pi t-4)\, e^{\cos^2(\pi t-4)}$

11. Find $\frac{dy}{dx}$ for $\ln(6y) = e^{y} \sin(9x)$.

$\frac{dy}{dx} = \frac{9y\,e^{y}\cos(9x)}{1-y\,e^{y}\sin(9x)}$

12. Evaluate the integral.

$\int \left(e^{9x}+2e^{-x}\right) dx$

$\int \left(e^{9x}+2e^{-x}\right) dx = \frac{e^{9x}}{9} - 2e^{-x} + C$ (Use C as the arbitrary constant.)

13. Evaluate the integral.

$\int_{\ln 3}^{\ln 9} e^{x}\, dx$

$\int_{\ln 3}^{\ln 9} e^{x}\, dx = 6$