

### 9.3 Corrective Assignment – The Number $e$

Algebra 2

Name: \_\_\_\_\_ ID: 2

Date: \_\_\_\_\_ Period: \_\_\_\_\_

**For 1-8, simplify. Your answer should contain only positive exponents**

1.  $(e^{-7} \cdot e^3)^{2x}$

2.  $-\frac{2e^{x+1}}{e^{2x}}$

3.  $e^x \cdot 2e^{3x-1}$

4.  $(3e^{-3x})^3$

5.  $\frac{2e^{6x+7}}{-e^5}$

6.  $(e^{3x} \cdot e^2)^{5x}$

7.  $(2e^{-4x})^3$

8.  $e^x \cdot 4e^{2x-3}$

**For 9-12, use a calculator to evaluate the expression. Round the result to three decimal places.**

9.  $-5e^2$

10.  $0.3e^7$

11.  $100e^{-4}$

12.  $-0.4e^3$

**For 13-16, tell whether the function is an example of exponential growth or exponential decay.**

13.  $y = \left(\frac{1}{e}\right)^{-0.6x}$

14.  $y = 4(e)^{-2x}$

15.  $y = -3(e)^{4x}$

16.  $y = \frac{1}{3}(e)^{0.08x}$

**For 17 – 20, write a model for each scenario and use the model to calculate the balance for the given number of years. (Not all problems involve *continuous* compounding...some are periodic!)**

17. You deposit \$600 in an account that pays 2.3% annual interest compounded continuously. How much will you have after 2.5 years?

18. You deposit \$7000 in an account that pays 5% annual interest compounded continuously. How much will you have after 23 years?

19. Your antique motor scooter is currently worth \$1,700 and is increasing in value by 4.8% per year. How much will it be worth in 9 years?

20. You deposit \$300 in an account that pays 2% annual interest compounded daily. How much will you have after 6 years?

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ANSWER KEY

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1)  $\frac{1}{e^{8x}}$

2)  $-2e^{-x+1}$  or  $-\frac{2}{e^{x-1}}$

3)  $2e^{4x-1}$

4)  $\frac{27}{e^{9x}}$

5)  $-2e^{6x+2}$

6)  $e^{15x^2+10x}$

7)  $\frac{8}{e^{12x}}$

8)  $4e^{3x-3}$

9)  $-36.945$

10)  $328.99$

11)  $1.832$

12)  $-8.034$

13) Growth

14) Decay

15) Growth

16) Growth

17)  $A(t) = 600e^{0.023t}$   
 $A(2.5) = \$635.51$

18)  $A(t) = 7000e^{0.05t}$   
 $A(23) = \$22,107.35$

19)  $V(t) = 1700(1.048)^t$   
 $V(9) = \$2,592.39$

20)  $A(t) = 300\left(1 + \frac{.02}{365}\right)^{365t}$   
 $A(6) = \$338.25$