



Name: _____ Date : _____

IM2 Unit 4 Quiz – Exponential Functions
Teacher: Mr. Santowski

Score: _____

PART 1 – CI QUESTIONS

1. Simplify the expression $\frac{(2xy^{-1})^{-2}}{(8x^3)(4y^3)^{-1}}$. Your final answer should NOT have any negative exponents.

[4 marks]

2. Evaluate the following expressions:

[8 marks]

a. $27^{\frac{2}{3}}$

b. $16^{-\frac{5}{4}}$

c. $f(2)$ where $f(x) = \frac{1}{4}(2)^{x-4} + 1$

3. Given the exponential function $f(x) = 25(0.95)^x$,

[6 marks]

- Does this function represent a growth function or a decay function? Show/explain how you know.
- At what rate does the function grow/decay?
- What is the value of the y-intercept of this function?

Mr. S. now writes a new equation as $g(x) = 25(0.95)^x + 20$

- Where does this new function have its y-intercept?
- Where does the new function have its asymptote?

PART 2 - CA QUESTIONS

4. Mr. S has invested some money for his son Ian's university education. When Ian was born, I invested \$10,000 into an investment that has been growing exponentially by 8% every year.

[6 marks]

- How much money is the investment worth, when Ian turns 20 years old? Show/explain the analysis that leads to your answer.
- How long does it take for the money to double in value? Show/explain the analysis that leads to your answer.

5. Mr. Dunham is doing a dice rolling experiment with his IM3 class. He starts the experiment with 150 dice and will remove any dice that shows a 2 or a 5. Listed below is the data set he compiled:

[9 marks]

Trial #	0	1	2	3	4	5	6	7	8
# of dice remaining	150	98	76	56	40	27	19	12	9

- Mr. Dunham would like to use a linear function to model the data. Explain to him why he cannot use a linear model for this data set.
- Mr. Smith would like to use an exponential function to model this data set. Explain to him why he can use an exponential model for this data set.
- Mr. Rawlings now wants an equation for the data. Show/explain how you would determine an equation for this data set.
- What is the equation that models this data set?
- Mr Santowski believes that you know the **theoretical equation** for this problem (simply by understanding the context for how we got the data). So, without any reference to the data set, what should the equation be and why?