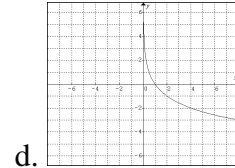
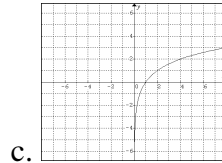
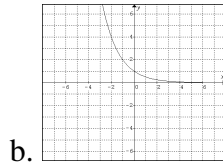
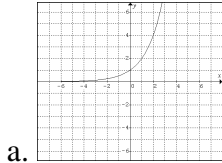


## Test #1 – Exponential and Logarithmic Functions

[40 marks]

### Part A: Multiple Choice [K/U, 10 marks]

1. Which of the following shows the graph of  $y = \left(\frac{1}{2}\right)^x$ ?



2. The domain of  $y = \log(x)$  is...
- a.  $\{x \in R\}$       b.  $\{x > 0, x \in R\}$       c.  $\{x < 0, x \in R\}$       d.  $\{x \neq 0, x \in R\}$
3. When simplified, the expression  $(3x^3y^2) \div (6x^4y)$  becomes...
- a.  $0.5xy$       b.  $\frac{2y}{x}$       c.  $\frac{2x}{y}$       d.  $18x^7y^3$
4. The value of a home in Detroit decreases by 5% per year. What is the decay rate?
- a. 0.05      b. 1.05      c. 0.95      d. 9.05
5. If  $2^{x-1} = 16$ , then  $x = \dots$
- a. 4      b. 5      c. 8      d. 9
6. The expression  $y = \log_b(x)$ , in exponential form, is...
- a.  $y = b^x$       b.  $x = b^y$       c.  $b = y^x$       d.  $b = x^y$
7. The value of  $\log_2 8$  is...
- a. 3      b. 4      c. 6      d. 256
8. How many times more intense is an “8” earthquake (on the Richter scale) than a “4”?
- a. 2      b. 4      c. 40      d. 10000
9. Which of the following equations shows a half-life of 15 minutes?
- a.  $y = 15(0.5)^x$       b.  $y = 10(0.5)^{t/15}$       c.  $y = 10(0.5)^{15/t}$       d.  $y = 10(15)^{1/2t}$
10. If  $\log_3(x-2) = 3$ , then  $x = \dots$
- a. 5      b. 29      c. 243      d. No solution
- B. How many lessons were been delayed / lost this unit to watching Olympic Hockey?
- a. 1      b. 2      c. 3      d. Too many

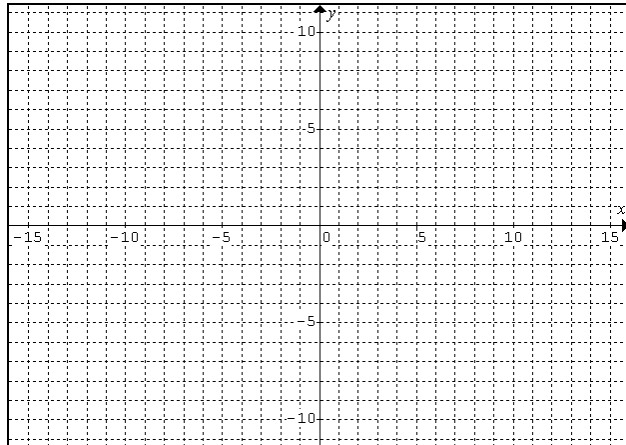


MCT 4C  
Mr. Kempe

Name: \_\_\_\_\_  
Date: \_\_\_\_\_

Part C: Problem Solving [ATIPS, 20 marks]

1. Sketch the graphs of  $y = 3^x$  and  $y = \log_3 x$  on the same axes. [4]



2. Solve the following equations for  $x$ : [4]

a.  $9^{x-4} = 27$

b.  $4^{2x-1} = \left(\frac{1}{4}\right)^{x+3}$

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Mr. Kempe

Name: \_\_\_\_\_  
Date: \_\_\_\_\_

3. Lake Chad, in Eastern Africa, covered 25000km<sup>2</sup> in 1983. The table below shows its size over subsequent years. Assuming this situation can be modelled by exponential decay,

- a. Determine the decay rate of the lake. [2]

Year	Size
1983	25000
1984	21750
1985	18900
1986	16450
1987	14300

- b. Predict the current size of the lake (2014). [2]

4. Angela invests \$1500 into a GIC earning 3% annually. Sam invests \$1000 into a mutual fund earning 5.2% annually. Which investment will reach \$2000 first? [4]

MCT 4C  
Mr. Kempe

Name: \_\_\_\_\_  
Date: \_\_\_\_\_

5. The half-life of Iodine-131 (used in medical testing) is about 8 days. A hospital orders 50 kg of I-131 from a supplier; the shipment arrives 5 days later. How much of the Iodine remains when it arrives at the hospital? [4 marks]

6. A liquid with a pH below 1.5 is considered extremely acidic (and dangerous!)  
a. Jacob is about to perform a science experiment with an acid whose  $H^+$  concentration is 0.025mol/L. Is this extremely acidic?

- b. Battery acid has a pH of 0. What is the concentration of  $H^+$ ?