# EXAM REVIEW

## CHAPTER 7: Exponential Functions

1. Write as a single power.  Express answers with positive exponents.  DO NOT EVALUATE.

(a) $4^3 \times 4 \times 4^2$

(b) $5(5^3)$

(c) $\dfrac{(-4)^6(-4)^3}{\left((-4)^9\right)^2}$

(d) $\dfrac{3^4}{(3^2)^3}$

(e) $\dfrac{(20^{-1})^8}{20^2 20^6}$

(f) $\left(\dfrac{1}{9}\right)^5\left(\dfrac{1}{9}\right)^{-3}$

2. Evaluate WITHOUT using a calculator.

(a) $256^{-\frac{5}{4}}$

(b) $\left(-\dfrac{1}{2}\right)^3 + 2^{-3}$

(c) $4^{-1} + 4^0 + 4^2$

(d) $16^{\frac{3}{2}}$

(e) $\left(\dfrac{27}{64}\right)^{\frac{-1}{3}}$

(f) $\sqrt[5]{-32}$

3. Complete the table.

| Exponential Form | Radical Form | Evaluation of Expression |
|---|---|---|
| $81^{\frac{1}{4}}$ | | |
| $27^{\frac{4}{3}}$ | | |
| | $\sqrt[5]{7776}$ | |
| $4096^{0.75}$ | | |

4. Use your calculator to evaluate each expression.  Express answers to two decimals.

(a) $256^{0.66}$

(b) $15^{\frac{-3}{2}}$

(c) $\sqrt[11]{3.7}$

(d) $\sqrt[4]{-99}$

5. Complete the table.

| Function | Exponential Growth or Decay? | Initial Value (y-intercept) | Growth/Decay rate |
|---|---|---|---|
| $P(n) = 200(1-0.032)^n$ | | | |
| $A(x) = (2)^x$ | | | |
| $Q(x) = 0.85(0.77)^x$ | | | |

6. Calculate finite differences to classify each function as linear, quadratic, exponential or none of those.

(a)

| x | y |
|---|---|
| -4 | 47 |
| -3 | 26 |
| -2 | 11 |
| -1 | 2 |
| 0 | -1 |

(b)

| x | y |
|---|---|
| -1 | 0.125 |
| 0 | 0.25 |
| 1 | 2 |
| 2 | 8 |
| 3 | 32 |

Conclusion _____          Conclusion _____

Formulas:

$$P = P_0(1+r)^n \qquad P = P_0(1-r)^n \qquad I(d) = I_0(1+r)^d \qquad N(d) = N_0(1+r)^d$$

7. Greg invests $750 in a bond that pays 4.3% per year.

   (a) Calculate, to the nearest penny, what Greg's total amount will be after 4 years. (Show your work)
   (b) How much money did $750 earn in four years?
   (c) If Greg is planning to enter University in 2018, would his money have doubled by then? (Show your work).

8. A police diver is searching a harbour for stolen goods. The equation that models the intensity of light per metre of depth is $I(n) = 100(0.92)^n$.

   (a) At what rate does the light diminish per metre?
   (b) Determine the amount of sunlight the diver will have at a depth of 18 m, relative to the intensity at the surface.

9. Ryan purchases a used vehicle for $11, 899. If the vehicle depreciates at a rate of 13% yearly, what will the car be worth, to the nearest dollar, in ten years? Show your work.

10. After being filled, a basketball loses 3.2% of its air every day. The initial amount of air in the ball was 840 $cm^3$

    (a) Write an equation to model this situation.
    (b) Determine the volume after 4 days.
    (c) Will this model be valid after 6 weeks? Explain.

11. List 4 characteristics of an exponential function.

# EXTRA QUESTIONS: Chapter 7   p. 526 # 1 - 8