**Chapter 7&8 TEST – Part II**

**Part I – CALCULATOR allowed**

**Multiple Choice**

**\_\_\_\_ 1.** To the nearest year, how long would an investment need to be left in the bank at 5%, compounded annually, for the investment to triple?

|  |  |  |  |
| --- | --- | --- | --- |
| **A** | 15 years | **C** | 28 years |
| **B** | 26 years | **D** | 23 years |

**\_\_\_\_ 2.** Solve . Round your answer to two decimal places.

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** | 3.06 | **C.** | 2.95 |
| **B.** | 7.26 | **D.** | –1.40 |

**\_\_\_\_ 3.** The common ratio for the geometric sequence 8, 1, 0.125, 0.015625, . . . is

|  |  |  |  |
| --- | --- | --- | --- |
| **A** |  | **C** | 8 |
| **B** | –8 | **D** |  |

**\_\_\_\_ 4.** How many terms are in the sequence 2, 8, 32, 128, 512, …, 2 097 152?

|  |  |  |  |
| --- | --- | --- | --- |
| **A** | 9 | **C** | 10 |
| **B** | 12 | **D** | 11 |

**\_\_\_\_ 5.** If you researched all your ancestors up to 16 generations back, how many people would you need to research?

|  |  |  |  |
| --- | --- | --- | --- |
| **A** | 262 140 | **C** | 65 535 |
| **B** | 131 070 | **D** | 131 069 |

**\_\_\_\_ 6.** Which of the following best describes the series –50 + () + () + () + ?

|  |  |
| --- | --- |
| **A** | The series is convergent and has a sum of . |
| **B** | The series is divergent and has a sum of . |
| **C** | The series is divergent and has no sum. |
| **D** | The series is convergent and has no sum. |

**Problem**

**7.** A bouncy ball bounces to  its height. Suppose the ball is dropped from 20 m.

**a)** What height will the ball bounce back up to after the sixth bounce? (to the nearest hundredth of a metre)  
  
  
  
  
  
**b)** What is the total distance the ball travels if it bounces indefinitely?

**8.** Jeff buys a new vehicle for $35 000. It is known that the vehicle will depreciate by 20% of its current value every year.

**a)** Write an equation to relate the value, *V*, of the vehicle to the age, *t*, in years, of the vehicle.

**b)** Use the equation to determine the value of the vehicle 2 years after Jeff buys it.

**c)** Approximately how long will it take the vehicle to depreciate to $3000?

**9.** Cobalt-60, which has a half-life of 5.3 years, is used in medical radiology. A sample of 60 mg of the material is present today.

**a)** Write an equation to relate the amount of cobalt-60 remaining and the time *t* in years.

**b)** What amount will be present in 10.6 years?

**c)** How many years will it take for the amount of cobalt-60 to decay to 12.5% of its initial amount?

**10.** A $21 500 investment earns 5.25% interest, compounded quarterly.

**a)** Determine the value of the investment in 5 years.

**b)** How long will it take the original investment to double in value?

**11.** The magnitude of an earthquake is defined as , where *A* is the amplitude of the ground motion and  is the amplitude corrected for the distance from the actual earthquake that would be expected for a “standard earthquake.” On March 2, 2012, an earthquake with a magnitude of 5.3 was recorded in Norman Wells, Northwest Territories. A few hours later, there was an aftershock that was 120 times weaker than the original earthquake.

What was the aftershock’s magnitude on the Richter scale?

**12.** A 200-g sample of a radioactive substance is placed in a chamber to be tested. After 3 h, 140 g of the sample remains.Determine the half-life of this substance, to the nearest hundredth of an hour.

**Chapter 7 TEST  
Part II – NO CALCULATOR**

**Multiple Choice**

*Identify the choice that best completes the statement or answers the question.*

**\_\_\_\_ 13.** A colony of ants has an initial population of 750 and triples every day. Which function can be used to model the ant population, *p*, after *t* days?

|  |  |  |  |
| --- | --- | --- | --- |
| **A** |  | **C** |  |
| **B** |  | **D** |  |

**Short Answer**

**14.** Solve for *x*:

**15.** Solve the equation .

**16.** Solve for *x*.



**17.** a) Rewrite in expanded form :   
b) Rewrite in sigma notation :