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| **Unit 5 Mathematical Models - Review** |
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1. Examine each equation and identify which type of relation (linear, quadratic, or exponential) each equation represents. Explain how you know.

a) *y* = 1.3(1.7)*x* b) y = 2x2 – x + 4 c) y = 5 – 2x

1. Determine if each table of values represents a linear, quadratic, or exponential model. Explain how you know.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Time (days) | Volume (mL) |  | Year | Population |  | x | y |
| 0 | 3.15 |  | 2005 | 423 |  | 1 | 23 |
| 2 | 6.05 |  | 2007 | 648 |  | 3 | 55 |
| 4 | 8.95 |  | 2009 | 993 |  | 5 | 103 |
| 6 | 11.85 |  | 2011 | 1521 |  | 7 | 167 |
| 8 | 14.75 |  | 2013 | 2330 |  |  |  |
| 10 | 17.65 |  |  |  |  |  |  |

1. For the **linear** table of values above, find the **slope.** Include units.
2. Simplify each expression (expression each as a power with positive exponents).
3.  b)  c)  d) 
4. Write as a root, then evaluate [4 marks]
5.  b) 
6. Solve for *x*.
7. 
8. 
9. 
10. 
11. The formula can be used to model the growth of money when interest is compounded monthly. Solve for i.
12. The volume of a sphere is given by the formula . Solve for r.
13. The formula  related the mass of an object (m), the speed of light (c) and energy (E).

* Solve for m.
* Solve for c.

1. Solve for x to two decimal places using a table of values to guess and check

1. Cynthia deposits money in a high interest savings account. The value of the account, V dollars, after t years is given by the equation:
   1. What does 2000 represent?
   2. What does 1.04 represent?
   3. How much money is the account after 13 years?
   4. Cynthia will buy a used car when she has saved $5000. After how many years will Cynthia buy her car?
2. Tritium, a radioactive gas that builds up in CANDU nuclear reactors, is collected, stored in pressurized gas cylinders, and sold to research laboratories. Tritium decays into helium over time. Its half-life is about 12.3 years.
   1. Write an equation that gives the mass of tritium remaining in a cylinder that originally contained 500 g of tritium.
   2. Estimate the time it takes until less than 5 g of tritium is present.
3. A colony of bacteria doubles in size every 20 min. How long will it take for a colony of 20 bacteria to grow to a population of 10000?

**Don’t forget:** 