BECA/Huson/Algebra II: Regents Prep
9 May 2024

Name: Solutions

**Practice Regents problems #9**

AII-F.BF.6 Represent and evaluate the sum of a finite arithmetic or finite geometric series, using summation (sigma) notation. For geometric series:

$$\sum_{k=1}^{n} a_k = a_1 + a_2 + \ldots + a_n = a_1\left(\frac{1-r^n}{1-r}\right)$$

1. Given the geometric sequence 55, 77, 107.8, 150.92, ...

   (a) Find the common ratio $r$.

   $r = \frac{77}{55} = \frac{107.8}{77} = \ldots = 1.4$

   (b) Write a recursive formula for the sequence.

   $a_1 = 55$

   $a_n = 1.4 \cdot a_{n-1}$

   (c) Write an explicit formula for the sequence.

   $a_n = 55 \cdot 1.4^{(n-1)}$

   (d) Find the sum of the first seven terms the sequence rounded to the *nearest tenth.*

   $S_7 = 55\left(\frac{1-1.4^7}{1-1.4}\right) = 1311.53568 \approx 1311.9$

2. Express each of the following using rational or integer exponents.

   (a) $\sqrt[3]{8x^4}$

   $= 2x^{\frac{4}{3}}$

   (b) $\sqrt[5]{x^{10}}\sqrt[3]{x^{-2}}$

   $= \frac{x^2}{x^{2/3}} = x^{\frac{4}{3}}$

3. Determine algebraically how long it would take an investment to double, to the *nearest tenth of a year*, given 4.25% interest rate, compounded continuously.

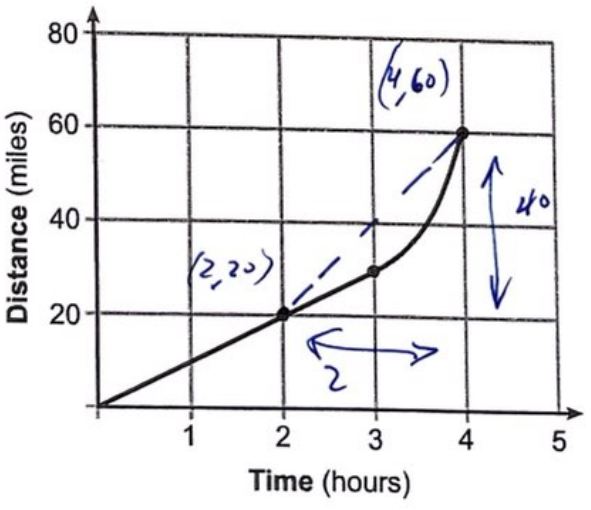
$$2 = 1e^{0.0425t}$$

$$0.0425t = \ln 2$$

$$t = \frac{\ln 2}{0.0425} = 16.30934\ldots$$

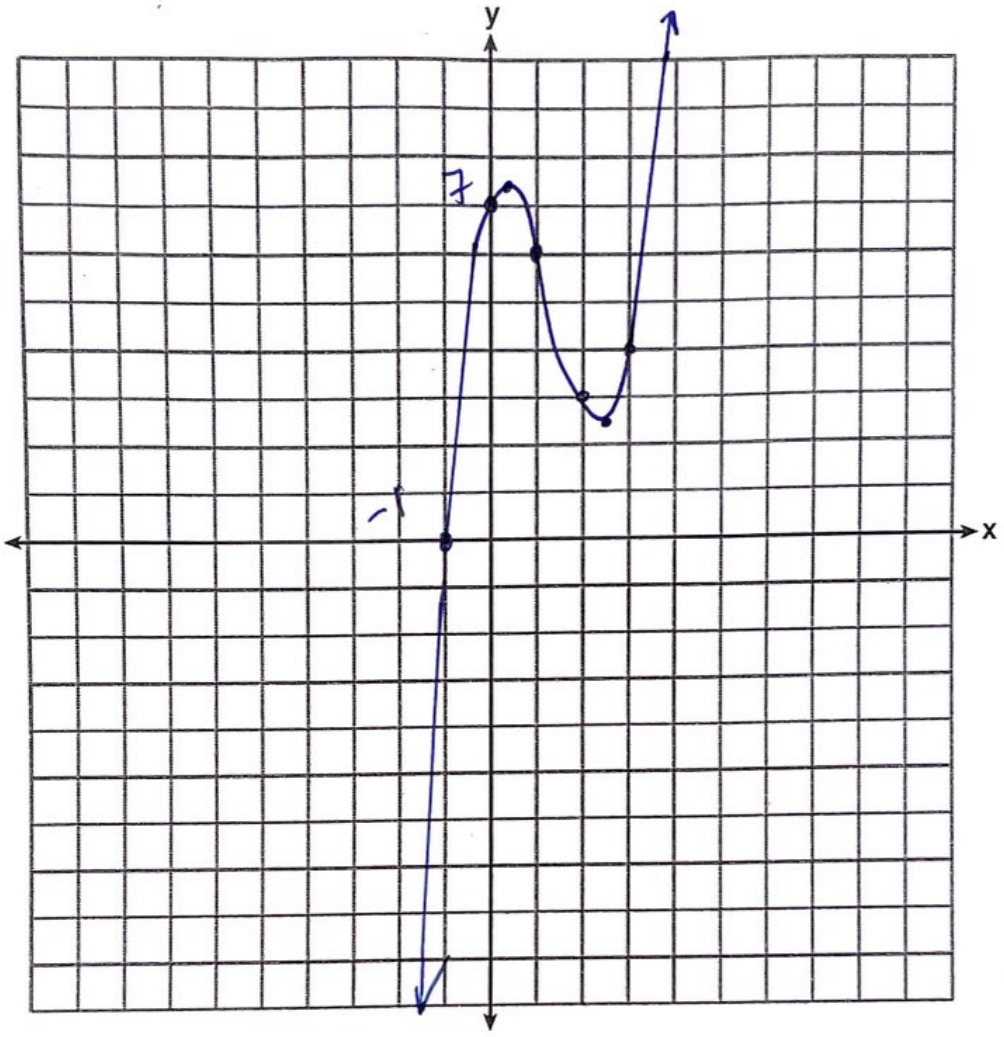
$$\approx 16.3$$

**25** Determine the average rate of change, in mph, from 2 to 4 hours on the graph shown below.




$$\bar{m} = \frac{40}{2} = 20 \text{ mph}$$

**32** Graph $y = x^3 - 4x^2 + 2x + 7$ on the set of axes below.



**26** The zeros of a quartic polynomial function are 2, −2, 4, and −4. Use the zeros to construct a possible sketch of the function, on the set of axes below.