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

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.

    (b) Write a recursive formula for the sequence.

    (c) Write an explicit formula for the sequence.

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

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

    (a) $\sqrt[3]{8x^4}$ (b) $\sqrt[5]{x^{10}} \sqrt[3]{x^{-2}}$

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.

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AII-F.LE.2: Construct a linear or exponential function symbolically given: a graph, a description of the relationship, or two input-output pairs (include reading these from a table).

4. Two functions are compared, a linear function $f(x)$ and the exponential function $g(x)$.

   (a) Fill out the table for $f(x)$ and write an explicit formula for the linear function.

Days	0	1	2	3	4
Area	30		60		

   (b) The geometric function is defined by $g(x) = 20 \cdot e^{\frac{x}{2}}$. On the grid below, sketch both functions, $f(x)$ and $g(x)$.
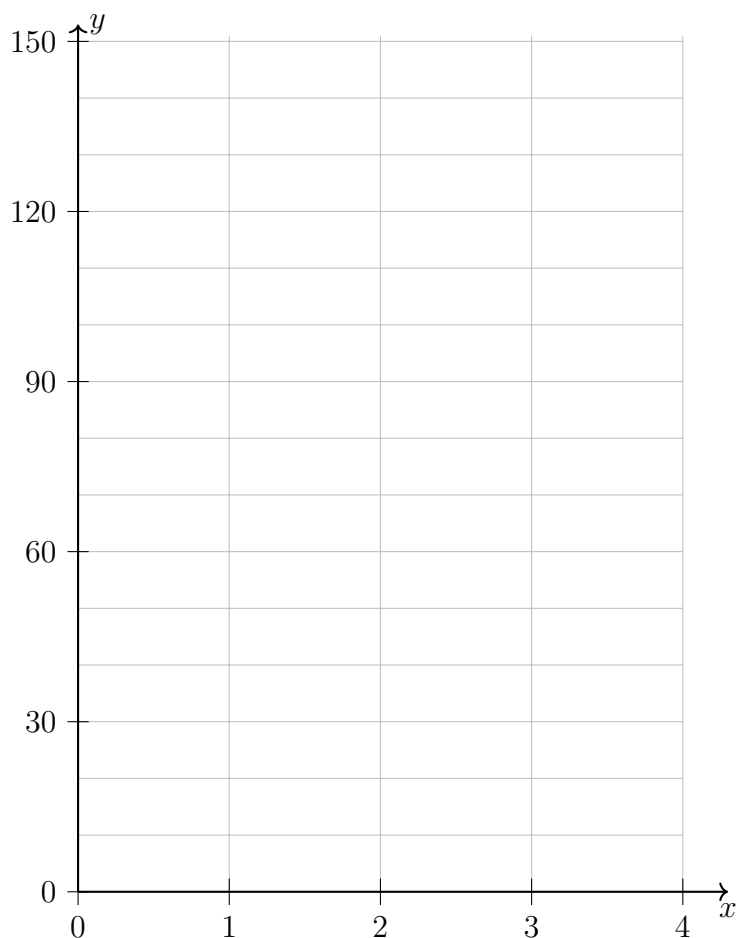
   (c) Mark the intersection of the two functions on the graph as an ordered pair, rounding to the *nearest tenth*.