

Math 4

Series/Sequence Quiz Review

1. Give the first 6 terms of the sequence: $\begin{cases} m_1 = 4 \\ m_n = 3m_{n-1} + 2 \end{cases}$

4, 14, 44, 134, 404, 1214

2. Fill in the blanks of the following geometric series:

____, -6, _____, _____, -162

$$r = \sqrt[3]{\frac{-162}{-6}} = \sqrt[3]{27} = 3$$

-2, -6, -18, -54, -162

3. Expand to find the sum. $\sum_{i=2}^5 4i - 7 = 1 + 5 + 9 + 13$
 $= 28$

4. Write the following in sigma notation: $9 + 4 + 1 + 0 + 1 + 4 + 9 + 16 + 25$

$$\sum_{i=-3}^5 i^2$$

5. a) Evaluate: $\sum_{i=3}^9 18 \left(\frac{2}{3}\right)^{i-1}$

$$S_n = \frac{8(1 - \frac{2^7}{3^7})}{1 - \frac{2}{3}}$$

$$S_n = 22.59533608$$

b) $\{3, 5.5, 8, \dots, 98\}$

$$3 + 2.5(n-1) = 98$$

$$n-1 = 38$$

$$n = 39$$

$$\sum_{n=1}^{39} 3 + 2.5(n-1) = 1969.5$$

$$S_n = \frac{1}{2}(39)(3 + 98) = 1969.5$$

6. How many terms of the series $g_n = 5 \cdot 2^{n-1}$ are needed so the sum of the sequence is 83,886,075?

$$83,886,075 = \frac{5(1-2^n)}{1-2}$$

$$-16,777,215 = 1-2^n$$

$$2^n = 16,777,216$$

$$n = 24$$

7. Solve: $6x^3 + 28x^2 - 10x = 0$

$$2x(3x^2 + 14x - 5) = 0$$

$$2x(3x - 1)(x + 5) = 0$$

$$x = 0 \quad \left\{ \quad x = \frac{1}{3} \quad \left\{ \quad x = -5 \right. \right.$$