

REVIEW WORKSHEET FOR CHAPTER 9

SHOW ALL WORK! Answer all questions asked in each problem.

Decide whether the sequence given represents an arithmetic sequence or a geometric sequence and then find the n^{th} term and the sum of the first n terms for the specified value of n .

- $-8, 4, -2, \dots$ $n = 7$
- $9, 14, 19, \dots$ $n = 14$
- $6, 8, 10, \dots$ $n = 31$
- In a geometric sequence, the 5^{th} term is 3 and the 8^{th} term is 24. Find the common ratio, and the first term.
- Find the sum of all the positive integral multiples of 7 that are less than 500.
- There are 30 layers of posts in a pile. The bottom layer contains 98 posts, and each layer above it contains three fewer posts than the preceding layer. How many posts are in the pile?
- A rubber ball is dropped from a height of 100 feet. If on each rebound the ball rises to $\frac{2}{3}$ of the height from which it last fell, what distance has it traversed up to the time it hits the ground for the fifth time? If we let it bounce in this fashion FOREVER, how far will it have traveled (total)?
- A student may answer any six of ten questions on an examination. In how many ways can her choice be made? What if the first two questions are required for all students, but the other four to be answered are the student's choice?
- An afterschool basketball squad consists of twelve people. Assuming that everyone can play any position, how many possible teams of five players can be formed? If the center for the team must be selected from among three specific players, but the rest of the team (four others) is to be selected from the remaining nine players, how many teams are possible?
- A student has five mathematics books, four history books and eight novels. In how many ways can they be arranged on a shelf if books in the same category are to be grouped on the shelf together? (Be careful, there are several things going on at once here)
- Find the sum: $-\frac{2}{5} + \frac{4}{25} - \frac{8}{125} + \dots$

12. Find the rational number whose decimal representation is $6.2\overline{74}$.

13. Prove inductively: $\frac{1}{1 \cdot 3} + \frac{1}{3 \cdot 5} + \frac{1}{5 \cdot 7} + \dots + \frac{1}{(2n-1) \cdot (2n+1)} = \frac{n}{2n+1}$

14. Find the sixth term in the expansion of $\left(\frac{2}{c} + \frac{c^2}{3}\right)^7$

15. Expand completely (use the binomial theorem) and simplify fully. $(3x^3 - 5y^2)^4$