

More Geometric Series

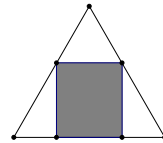
1. If $a_1 + a_2 + a_3 + \dots$ is a geometric series with $a_1 = 4$ and sum 12, find a_2 .
2. Find a formula for a geometric sequence with $a_1 = 10000$ and $a_2 = 9500$.
3. Find a formula for a geometric sequence with $a_2 = 10000$ and $a_3 = 9500$.
4. Find a formula for a geometric sequence with $a_2 = 10000$ and $a_4 = 9500$.
5. If $\{a_n\}$ is an arithmetic sequence, which of the following is also an arithmetic sequence? Justify your answer.
 - a. $b_n = (a_n)^2$
 - b. $c_n = 2a_n + 3$
 - c. $d_n = a_{2n}$ (i.e. $d_1 = a_2, d_2 = a_4, d_3 = a_6$, etc.)

6. If $1 + x + x^2 + \dots = 8$, compute $1 + x^2 + x^4 + x^6 + \dots$

A star batter hits the ball about 30% of the time he goes to bat. So ...

7. What is the probability of exactly 2 hits in 6 at bats?
8. What is the probability of exactly 4 hits in 12 at bats?
9. Suppose that a lightbulb manufacturer promises that only 1% of lightbulbs are defective. In a sample of 50 lightbulbs, 4 are defective.
 - a. What is the probability that exactly 4 of 50 are defective, given a 1% probability for each individual bulb?
 - b. What is the probability that 3 or fewer are defective?
 - c. Use the answer to (b) to give the probability that 4 or more are defective.

10. A rectangle is inscribed in an equilateral triangle of perimeter 18 as shown at right. Find the maximum area of such a rectangle. (Don't assume it's a square!)



11. What transformations, in what order, produce the graph of $y = 4 \sin(6x + 30) + 2$ from the graph of $y = \sin x$?
12. If the domain of f is $[4, 11]$ and the range of f is $[6, 12]$, find the domain and range of

- a. $f^{-1}(x)$
- b. $\frac{1}{f(x)}$
- c. $f(\sqrt{x})$
- d. $-2f(3x)$