

Algebra Review

You should be able to solve all of these problems by hand without the aid of a book or computer.

1. Rewrite $12(3^{n-1}) - 15(5^{n-1}) - 2(3^n) + (5^n)$ in the form $p(3^{n+1}) + q(5^{n+1})$. Note that p and q are real number constants.
2. Solve for x :
 - a. $x^2 + 4x - 12 = 0$
 - b. $x^2 - 3x - 3 = 0$
 - c. $x^3 - 7x - 6 = 0$
3. Solve for a and b in this simultaneous system of equations:
 $5a - 3b = 7$
 $7a - 4b = 11$
4. Solve for a , b and c in this simultaneous system of equations:
 $3a + 5b - 3c = -4$
 $2a - 5b - 2c = 14$
 $2a + 2b + 3c = 5$
5. Consider this geometric sequence: $10/16, 10/8, 10/4, 10/2, 10, 20, 40 \dots$
 - a. What is the n -th term of the sequence? In other words, write a formula that will return the value of one of the terms. For example, if $n = 1$, the formula should evaluate to $10/16$.
 - b. What is the sum of the first n terms?
6. What is the coefficient of x^3 in $(x + 1)^{10}$?
7. Find the values of a and b for which the following equation is true for all possible real values of x :
 $7x^2 + 18x = 2ax^2 + 3ax + 5bx^2$
8. If the common log of 2 is 0.3, then give your best estimate for the number of digits in the number 5^n . You may assume that n is large.