PROGRESSIONS

Standard Results:

1. $1+2+3+\ldots+n=\frac{n(n+1)}{2}$
2. $1^2+2^2+3^2+\ldots+n^2=\frac{n(n+1)(2n+1)}{6}$
3. $1^3+2^3+3^3+\ldots+n^3=\left[\frac{n(n+1)}{2}\right]^2$
4. 1 + 3 + 5 + … to n terms = n^2.
5. 2 + 4 + 6 + … to n terms = n (n + 1).
6. The sum of all possible products of the first n natural numbers taken two at a time is $\frac{1}{24}n(n^2-1)(3n+2)$
7. $\Sigma(2r-1)^2=1+3^2+5^2+7^2+\ldots\ldots+(2n-1)^2=\frac{n(4n^2-1)}{3}$
8. $\Sigma(2r-1)^3=1+3^3+5^3+7^3+\ldots\ldots+(2n-1)^3=n^2(2n^2-1)$

References :

1) http://www.mathcentre.ac.uk/resources/uploaded/mc-ty-apgp-2009-1.pdf
2) http://www.careerbless.com/aptitude/qa/sequence_series_imp.php
3) http://www.math10.com/forum/viewforum.php?f=7
4) http://www.math10.com/en/algebra/geometric-progression.html
5) http://www.math10.com/en/algebra/arithmetic-progression.html
6) http://www.trans4mind.com/personal_development/mathematics/series/airthmeticGeometricSeries.htm
7) https://brilliant.org/wiki/arithmetic-progressions/

The first term is 8 and the common difference is d, where d doesn't = 0. The first term, the fifth term, and the eighth term of the progression are the first term, the

second term and the third term, respectively, of a geometric progression whose common ratio is r.

What are two equations connecting d and r, hence how do you show that r=3/4 and find the value of d?

Also what is the sum to infinity of the geometric progression?

Also how do you find the sum of the first 8 terms of the arithmetic progression?

Questions -
http://questions.ascenteducation.com/iim_cat_mba_free_sample_questions_math_quant/arithmetic_geometric_progressions/

THEORY

http://totalgadha.com/mod/forum/discuss.php?d=4233

SOME PROBLEMS

http://www.analyzemath.com/math_problems/arith-seq-problems.html