PROGRESSIONS.

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10. Find 7 terms of an A. P. such that their sum shall be 14 and the sum of their squares 84.

11. In an A. P. the product of the first and eighth terms is less by k than the product of the second and seventh. How much less is the product of the third and sixth than that of the fourth and fifth?

12. Express the sum of n terms of an A. P. in terms of the first term and the C. D.

13. If a and b are the first two terms of an A. P., express the last term and the sum of n terms.

14. Prove that if the sum of m terms of an A. P. be n, and the sum of n terms be m, we shall have

2 (m + n) + mnd = 0.15. If a², b², c² be in A. P., then, $\frac{1}{a+b}$, $\frac{1}{c+a}$, $\frac{1}{b+c}$

will also be in A. P.

16. The sum of the first three terms of an A. P. is 15 and the sum of their squares is 83. What is the sum of n terms?

17. In a progression of 9 terms, the third term is 10 and the sum 153. Find the first term and common difference.

18. In an A. P. a certain term is k; there are 2n terms before k and n terms after it, and the sum of all the terms is 3n + 1. Find the C. D.

19. Two men start simultaneously from the same point in the same direction. The one walks m miles the first day, and diminishes his walk by h miles each day; the other walks n miles the first day, and increases his walk h miles each day. How far will the latter be ahead at the end of i days?

20. Express the sum of the G. P.'s:

 $a^{n} + a^{2n} + a^{3n} + \dots + a^{10n};$ $a^{n} + a^{2n} + a^{3n} + \dots + a^{mn};$ $1 + \sqrt{3} + 3 + \dots + 3^{4}.$

21. The sum of the first and seventh terms of a G. P. is h, and the sum of the second and eighth is k. Find the first term and the C. R.

22. The sum of the first and fifth terms of a G. P. being