## ¶ 112. ¶ 113

: worth of £60 '9966—£889

al annuity of the purchaser Sycars in reears?

462 15s. 1<sup>4</sup>d. est have been e half-yearly, rate per cent, before, and so

2. What is the er of terms, are stremes and ra-5. When the n, how do you a fraction, how 8. How does it form a geomeerest ? ---- the m? 10. When lo you find the pu find P ? 12. When A P and annuity? 15. is the amount? n annuity equiy, at compound ty? --- how he table ? 20, do you find the - by the table? tate, or a pery the table ?

finding how f things may 1. Four gentlemen agreed to dine together, so long as they could sit every day in a different order or position; how many days did they dine together ?

Had there been but two of them, a and b, they could sit only in 2 times 1 (1×2=2) different positions, thus, a b, and b a. Had there been three, a b and c, they could sit in 1×2×3=6 different positions; for, beginning the order with a, there will be two positions, viz a b c, and a c b; next beginning with b, there will be two positions, b a c, and b c a; lastly, beginning with c, we have c a b, and c b a, that is, in all, 1×2×3=6 different positions. In the same manner if there be four, the different positions will be 1×2×3×4=24. Ans. 24.

Hence, to find the number of different changes or permutations, of which any number of different things are capable,—Multiply continually together all the terms of the natural series of numbers, from *one* up to the given number, and the last product will be the answer.

2. How many variations may there be in the position of the nine digits? Ans. 362880.

3. A man bought 25 cows, agreeing to pay for them one penny for every different order in which they could all be placed; how much did the cows cost him?

Ans. £64630041847212441600000. 4. A certain church has 8 bells; how many changes may be rung upon them ? Ans. 40320.

## MISCELLANEOUS EXAMPLES.

¶ **113.** 1.  $\overline{4+6} \times \overline{7-1} = 60$ .

A line, or *vinculum*, drawn over several numbers, signifies that the numbers under it are to be taken jointly, or as one whole number

- 2.  $9-8+4\times8+4-6$  how many? Ans. 30.
- 3.  $7+4-2+3+40\times5$  how many? Ans. 230.  $3+6-2\times4-2$
- 4.  $2 \times 2$  =how many? Ans.  $3_2$ .

5. There are 2 numbers; the greater is 25 times 78, and their difference is 9 times 15; their sum and product are