

Also if 3, 9, 21, 63, were given (which are inter-rapped) 1 by 9 times 21 is equal to 3 times 63, which is equal to 189.

From hence ariseth that precious Gem in Arithmetick, which for the Excellency thereof is called the *Golden Rule*, or *Rule of Three*.

## CHAP. X.

### The Single Rule of Three Direct.

1. **T**HIS Rule of Three (not underevredly call'd the *Golden Rule*) is, that by which we find out a fourth member, in perspective unto three given Numbers, so as this fourth Member sought may bear the same Rate, Reason, or Proportion to the third (given) number, as this second doth to the first, from whence it is also call'd the Rule of Proportion.

2. Four Numbers are said to be *Proportional*, when the first containeth or is contain'd by the second, as often as the third containeth or is contain'd by the fourth. *Vide Wingate's Arith Chap. 8. Sect. 4.*

3. The Numbers are said to be *Proportional*, etc. 3, 6, 9, 18, for as often as the first Number is contain'd in the second, so often is the third contain'd in the fourth, etc. twice. Also 9, 3, 15, 5, are said to be *proportional*, for as often as the first Number containeth the second, so often the third Number containeth the fourth; etc. 3 times.

3. The Rule of Three is either simple or compound.

4. The simple (or single) Rule of Three, consisteth of 4 Numbers; that is to say, it hath 3 Numbers given to find out a fourth; and this is either Direct, or Inverse. *Vide Alfred. Math. lib. 2. cap. 13.*

5. The single Rule of Three Direct, is when the purchase of the first Term is to the second, as the third is to the fourth; or when it is required that the Number sought

### CHAP. 10. of Three Direct.

109

fought (viz.) the fourth Number shall have the same proportion to the second, as the third hath to the first.

6. In the Rule of Three, the greatest difficulty is (after the Question is propounded) to discover the order of the 3 Terms, viz. which is the first, which is the second, and which the third, which that you may understand, observe, That (of the three given numbers) two are always of one kind, and the other is of the same kind with the proportional number that is sought; as in this Question, viz. If 4 yards of Cloth cost 12 Shillings, what will 6 yards cost at that rate? Here the two numbers of one kind are 4 and 6, viz. they both figure for many yards; and 12 Shillings is the same kind with the number sought, for the price of 6 yards is sought.

Again, observe, that of the 3 given numbers, those two that are of the same kind, one of them shall be the first and the other the third, and that which is of the same kind with the number sought, shall be the second number in the Rule of Three; and that you may know which your third, know this, that to one of those two numbers there is always affixed a demand, and that number upon which the demand lieth must always be reckoned the third number. As in the forementioned Question, the demand is affixed to the number 6, for it is demanded what 6 yards will cost; and therefore 6 must be the third number, and 4 (which is of the same denomination (or kind) with it) must be the first, and consequently the number 12 must be the second, and then the numbers being placed in the forementioned order, will stand as followeth, viz.

$$\begin{array}{r} \text{yards} \\ 4 \text{ ————— } 12 \text{ ————— } 6 \end{array}$$

7. In the Rule of Three Direct (having placed the numbers as is before directed) the next thing to be done will be to find out the fourth number in proportion, which (that you may do), multiply the second number by

104

The single Rule

CHAP. 10.

by the third, and divide the product thereof by the first, (or which is all one) multiply the third term (or number) by the second, and divide the product thereof by the first, and the Quotient thence arising is the 4th number in a direct proportion, and is the number sought, or Answer to the question, and is of the same denomination that the second number is of. As thus, let the same Question be again repeated, viz. If 4 yards of Cloth cost 12 Shillings, what will 6 yards cost?

Having placed my numbers according to the sixth Rule (of this Chapter) foregoing, I multiply (the second number) 12 by (the third number) 6, and the product is 72, which product I divide by (the first number) 4, and the quotient thence arising is 18, which is the fourth proportional or number sought, viz. 18 Shillings, (because the second number is Shillings) which is the price of the 6 yards, as was required by the question. See the work following:

$$\begin{array}{r} \text{sh} \\ 4 \text{ ————— } 12 \text{ ————— } 6 \text{ ————— } 18 \\ 4) 72 \text{ (18 Shillings)} \\ \underline{16} \\ 36 \\ \underline{32} \\ 4 \end{array}$$

Ques. 2. Another Question may be this, viz. If 7 C. of Pepper cost 21 l. how much will 16 C. cost at that rate?

To resolve which question, I consider that (according to the 6th Rule of this Chapter) the terms or numbers ought to be placed thus, viz. the Demand lying upon 16 C. it must be the third number, and that of the same kind with it shall be the first, viz. 7 C. and 21 l. (being of the same kind with the number sought) shall be the second number in this question; then I proceed