

# SHREWSBURY SCHOOL.

## ARITHMETIC PRIZE, 1932.

- 1.—Calculate to six places of decimals the value of :

$$\frac{1}{1} - \frac{1}{1.2.3.} + \frac{1}{1.2.3.4.5.} - \frac{1}{1.2.3.4.5.6.7.} + \text{etc.}$$

- 2.—A house possesses three clocks, X, Y, Z, which go at uniform rates. At 10 a.m. on Tuesday, X is two mins. slow, Y is three mins. slow and Z is correct. At six p.m. on Wednesday Y shows correct time, while Z is 4 mins. slow. It is noticed that X is  $2\frac{1}{2}$  mins. ahead of Y at 10 a.m. on Thursday. When did X and Z indicate the same time.
- 3.—Find the values of the digits a, b, and c, if the number  $5,a47,b3c$  is exactly divisible by 693.
- 4.—Two snails set out from the bottom of a drain-pipe 6 ft. high and 4 ins. in diameter and climb to the top in uniform spirals, the first making one complete revolution, the second two. If the first takes 20 min. to reach the top, how long does the second take at the same speed? If on the other hand they reach the top at the same time, find how far the second has gone when they first meet.
- 5.—A and B are just 17 and 18 years old respectively. £15,600 is divided between them so that each person receives the same sum of money on reaching 21 years of age; the portions having meanwhile been invested at 8% compound interest. How was the money divided, and what does each receive on reaching 21 years?
- 6.—Two men, A and B, are exactly similar except for their shoes. A is 6 ft. and B 5 ft. 4 ins. in height. Standing on soft sand they both sink to the same depth. If A is wearing size 9 shoes (9 ins. long), his correct size, find what size shoes B is wearing, and what is his correct size. What weight would B have to carry to sink to the same depth in  $9\frac{1}{2}$  shoes? (Assume corresponding volumes, and areas to be in the same ratio as the cubes and squares respectively, of corresponding linear measurements).
- 7.—Two heaps of dry uniform sand of heights 5 ins. and 7 ins. are made into one: find its height. (Answer correct to 3 places of decimals.)
- 8.—The average length of six pieces of wood is 37.65 ins., the longest piece is 40.2 ins. long and the shortest 32.8 ins. Find the average length of the five longest and also of the five shortest.
- 9.—An examination paper contains 6 questions. 6% of the candidates answer 6 questions, and 4% answer none. Of the remainder 10% answer 5 questions and 15% answer 1 question. Of the candidates now remaining, 40% answer 4 questions, and 30% answer 2 questions. If 81 candidates answer 3 questions, find the total number of