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(Department of Education).

BRAINSE AN MHEÁN-OIDEACHAIS
(Secondary Education Branch).

LEAVING CERTIFICATE EXAMINATION, 1930.

MATHEMATICS.

ARITHMETIC—Paper B.

MONDAY, 16th JUNE.—MORNING 10.45 A.M. TO 12.15 P.M.

Five questions may be answered.

Mathematical Tables may be obtained from the Superintendent.

(All questions carry equal marks.)

1. Use logarithms to find the value of θ from the formula

$$\theta = \frac{\gamma - 1}{\gamma} \times \frac{x}{a^2 v e} \quad \text{where } \gamma = 1.405, \quad x = 0.239 \times 4.2 \times 10^7,$$
$$a = 0.0037, \quad v = 773, \quad e = 1.014 \times 10^6.$$

2. A plot of land is sold at £200 per acre. What is the price (to the nearest centime) per square metre if £1 = 124.01 francs ?

3. Find the weight of a hollow spherical shell, $\frac{1}{2}$ inch thick and outside diameter 10 inches, which is made of iron weighing 450 lbs. per cubic foot. Give your answer to a *tenth* of a lb.

4. Assuming that the earth's circumference is 40.03 million metres, calculate the length of the circumference in miles and the area of the earth's surface in square miles, as accurately as the data will allow.

5. A rectangular field of area 18 acres is twice as long as it is broad. At what rate did a man walk who walked round the field in $11\frac{1}{4}$ minutes ? Give your answer in miles per hour to within 1 per cent. error.

6. Three men start together and continue running the same way round a circular course which is 220 yards in circumference. If they run at 10, 8 and 6 miles per hour respectively, find the earliest time when they will be all together again at the starting point.

7. From the sale of an article to a customer at £858 the manufacturer, agent and shopkeeper had profits of 10, 20 and 30 per cent. in turn : find the cost of the article to the manufacturer.

If, instead of 10, 20 and 30 per cent. in the above transactions, each percentage had been the same, what would this percentage be, the costs to the manufacturer and customer remaining unaltered ?

8. If the price of a $4\frac{1}{4}$ per cent. stock were £17 less per £100 of stock than it is, the investment would yield a prospective investor $1\frac{1}{4}$ per cent. more on his money. Find the price of the stock.

9. A motorist sets out at the rate of 30 miles per hour and stops for 18 minutes at the end of each hour's motoring. A second motorist starting at the same time and place and on the same route, proceeds at 45 miles per hour for $1\frac{1}{2}$ hours, stops for an hour, and returns at a uniform speed, meeting the first motorist just as he is leaving his second stopping place and then after doing another 6 miles he meets a third motorist. If the third motorist left the starting place 1 hour after the other two, find graphically at what rate he was travelling and how far he had gone when he met the second motorist.