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(Department of Education).

BRAINSE AN MHEÁN-OIDEACHAIS
(Secondary Education Branch).

LEAVING CERTIFICATE EXAMINATION, 1931.

MATHEMATICS.

ARITHMETIC—Paper B.

FRIDAY, 12th JUNE.—MORNING 10.45 A.M. TO 12.15 P.M.

Five questions may be answered.

Mathematical Tables may be obtained from the Superintendent.

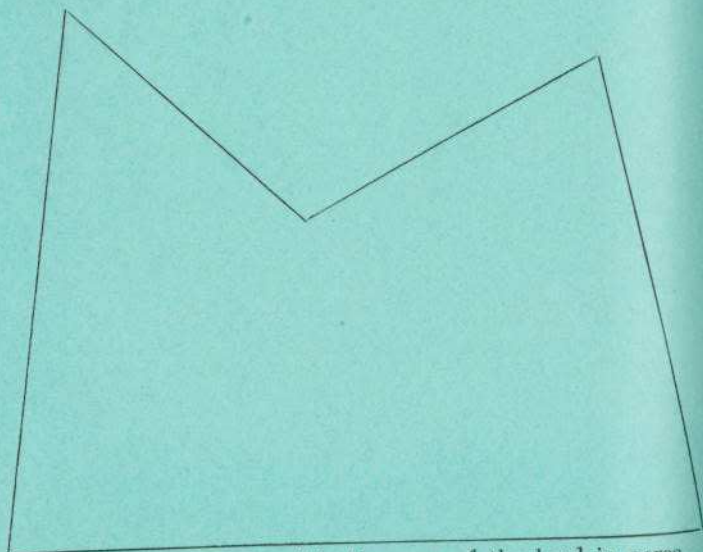
(All questions carry equal marks.)

1. Roughly estimate the value of

$$\frac{(2.04)^4 + \sqrt{3.79}}{99(0.00486)^3}$$

and then use logarithms to find a more accurate result.

2. The diagram represents an area of land on the scale of 1 inch to 5 miles.



Find as accurately as possible the area of the land in acres.

3. A cistern has 3 supply pipes and one waste tap. It can be filled by *two* of the supply pipes in 12, $12\frac{6}{7}$ or $16\frac{4}{11}$ minutes according to the two chosen, and emptied by the waste tap in 15 minutes. If all four are opened together, how long will it take to fill the cistern?

What times would be taken by each supply pipe separately?

4. Machinery now value £1,000 depreciates each year at the rate of 10% of its value at the beginning of the year. What will it be worth after 3 years? How many years must elapse before it will be worth less than one-fourth of its original value?

5. A substance can be bought at 9 francs per kilogram in France and at 1/- per lb. in Ireland. If there is an import duty of $33\frac{1}{3}\%$ on it entering Ireland and no charge is made for carriage, would it be cheaper for an Irishman to purchase supplies direct from France than to buy in Ireland? What would the difference (to the nearest shilling) be per ton?

(Note.—£1=124 francs.)

6. The weight of a solid sphere whose radius is 12 cms. is 90 kilograms. Find the weight in lbs., to the nearest lb., of a sphere of the same material whose radius is 6 inches.

7. A man sells out his holding of $3\frac{1}{3}\%$ stock at 91. In what proportion should he re-invest his money in 4% stock at 96 and 3% stock at 90 so that he would have the same income as formerly?

8. Two clocks are started together showing the correct time at noon on a certain day. On the following day at 8 p.m. there is a difference of half an hour between them. If each clock goes at a uniform rate and one gains 3 minutes while the other loses 2 minutes, find how soon again from the time they were started (i) both will show the *same* time, (ii) one of them will show the *correct* time, (iii) both will show the *correct* time.

9. The diameters of the ends of the frustum of a cone are 4 feet and 3 feet respectively and its height is $2\frac{1}{2}$ feet. Find the diameter of a sphere having the same volume as this frustum.