AN ROINN OIDEACHAIS
(Department of Education).

BRAINSE AN MHEAN-OIDEACHAIS
(Secondary Education Branch).

LEAVING CERTIFICATE EXAMINATION, 1933.

MATHEMATICS.

ARITHMETIC.

MONDAY, 19*th JUNE*.—Morning, 10 a.m. to 12 noon.

Six questions may be answered.

Mathematical Tables may be obtained from the Superintendent.

(All questions carry equal marks.)

1. £50 17s. was paid for 7 tons 3 cwt. 2 qrs. of goods which were sold at £7 10s. 6d. per ton. What was the percentage profit ?

2. Find the value of $\sqrt{\dfrac{x^3 - y^3}{x^3 + y^3}}$ when $x = 4 \cdot 86$ and $y = 3 \cdot 07$.

Give your answer to two decimal places.

3. (*i*) The length of a rectangle is increased by 6% and its width is increased by 7%. What is the percentage increase in its area ?

(*ii*) If the length of a rectangle is increased by 5% by how much per cent. must the width be decreased if the area is to remain unaltered ?

4. Two strings of equal length are bent, one to form a circle and the other to form a regular hexagon. Express the area of the latter as a decimal of that of the former, giving the answer to two places of decimals.

5. Solve the following (graphically or otherwise) : A and B began work on the same date, but on different scales of salaries, which increased by constant increments from year to year (A's increment being different from B's). A received £125 and £175 for the 3rd and 8th years respectively ; B received £95 and £215 for the 2nd and 10th years respectively. Find :

    (i) In what year did they receive equal salaries ?

    (ii) What did each receive for the first year ?

    (iii) In what year B's salary exceeded that of A by £75 ?

6. In a certain district in which all the inhabitants speak either Irish or English or both, 72% of the people can speak Irish and 60% can speak English; what percentage can speak both languages?

If 80 people who speak Irish only come into the district, the persons speaking Irish only will now form 43% of the total. Find the population in the first instance.

7. Two solid spheres are made of the same material and weigh 397 lbs. and 865 lbs. respectively. The radius of the smaller sphere is 14 ins.; find (i) the radius, (ii) the area of the larger.

8. Saving Certificates cost 16s. each and are worth 24s. at the end of ten years; what rate per cent., compound interest, is that equivalent to?

Which would be the better investment: 9% stock at 221 or Saving Certificates?

9. The side of a square plot of ground ABCD is 50 yards long and M is the mid-point of CD. A goat, tethered to a rope one end of which is fixed at M, can graze any part of the plot not more than 30 yards from M; find, to the nearest square yard, the area over which the goat can graze.

10. A man bought a house for £1,200 and paid £500 cash. He began to pay the balance in annual instalments of £100, the first being made a year from the date of the purchase. After paying his 8th instalment, what was the amount still due, assuming that compound interest at the rate of 5% per annum was charged on the amounts outstanding throughout the transaction?