

AN ROINN OIDEACHAIS  
(Department of Education).

BRAINNSE AN MHEADHON-OIDEACHAIS  
(Secondary Education Branch).

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LEAVING CERTIFICATE EXAMINATION, 1937.

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MATHEMATICS.

ARITHMETIC.

FRIDAY, 18th JUNE,—MORNING, 10 A.M. TO 12 NOON.

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Six questions may be answered.

Mathematical Tables may be obtained from the Superintendent.

1. Goods weighing 17 tons 16 cwt. 3 qrs. were bought at £1 18s. 6d. per ton and the lot was sold for £50 16s. Find (i) the total profit, (ii) the percentage profit, correct to *two* significant figures.  
[30 marks.]

2. Find in simplest form a multiplier which will convert "*inches per second*" into "*miles per hour*." Using that multiplier express (i) a speed of 50 inches in three seconds in miles per hour; (ii) a speed of 35 miles in  $2\frac{1}{4}$  hours in inches per second.  
[30 marks.]

3. Two sums of money, one of £700 and the other of £850 were invested at Compound Interest at 6% and  $x\%$  respectively. The two amounts were equal at the end of 10 years: using the Tables calculate the value of  $x$ .  
[30 marks.]

4. If a *Metre* = 39.3708 inches and an *Are* = 100 square metres, find, correct to *three* significant figures, the number of acres in a *hectare*.

Hence express in £s per acre a rental of 9,000 francs per hectare. Give result to the nearest £1. (Hectare = 100 ares; £1 = 105 francs).  
[30 marks.]

5. A train 264 yards long overtook a man travelling at a uniform rate and passed him in 15 seconds. If the man had been travelling in the opposite direction the train would have passed him in 9 seconds. Calculate the speed of the train and the man's speed in miles per hour.

[30 marks.]

6. A solid right prism is 18 inches high and stands on a triangular base whose sides are 9 ins., 11 ins., 14 ins. The material of the prism is 7.4 times heavier than water. Calculate the volume of the prism and its weight (to the nearest pound). [See Tables, page 33.]

[35 marks.]

7. Without doing the ordinary division in full how can it be determined whether a given number is divisible by each of the following separately: 3, 5, 8, 9, 11?

A prime number of three digits is such that the units' digit is equal to the sum of the other two: prove that the units' digit is either 7 or 1 and write down two numbers which satisfy the conditions of the question.

[35 marks.]

8. The following figures deal with the *Stock Exchange* :—

	<i>Annual Dividend</i>	<i>Price on Stock Exchange.</i>
A: £1 Shares :	6%	24s. 6d.
B: £1 „ :	12%	52s. 6d.
C: £2 „ :	15½%	117s. 6d.
D: £100 Stock :	5%	£115

Find (i) which of the four items A, B, C, D yields the highest dividend at the prices quoted; (ii) what difference it would make in a man's income if he invested £1,081 in the item yielding the highest dividend rather than in the item yielding the lowest dividend.

[35 marks.]

9. An equilateral cone and a sphere have equal total surface areas. Express in simplest surd form: (i) the ratio of the diameter of the base of the cone to the diameter of the sphere; (ii) the ratio of the volume of the cone to that of the sphere.

(NOTE: A cone is "equilateral" when the diameter of its base is equal to the slant height.)

[35 marks.]