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(Department of Education).

BRAINNSE AN MHEÁN-OIDEACHAIS
(Secondary Education Branch).

LEAVING CERTIFICATE EXAMINATION, 1934.

MATHEMATICS.

ARITHMETIC.

FRIDAY, 15th JUNE.—MORNING, 10 A.M. TO 12 NOON.

Six questions may be answered.

Mathematical Tables may be obtained from the Superintendent.

1. Find to three significant figures the value of c which satisfies the relation

$$a^4 = b^4 + c^4, \text{ when } a = 5.63, b = 3.97.$$

[33 marks.]

2. An article which cost $4\frac{1}{2}$ d. per lb. to manufacture was sold at 9d. a packet. When the cost of manufacture had risen 10%, the article was still sold at 9d. a packet, but each packet now contained $15\frac{1}{4}$ ozs. instead of 1 lb. What percentage profit was the manufacturer then making?

[33 marks.]

3. A grass plot whose perimeter is a mile, consists of a rectangle ABCD in which $AB = 2BC$, together with semicircles described outwards on BC, AD. All round the plot is a race-track 18 feet wide. Calculate (i) the external perimeter of the race-track, and (ii) the area of the grass plot.

[33 marks.]

4. Two straight lines A and B are $2\frac{5}{8}$ ins., and $5\frac{5}{8}$ ins. long respectively. Find (i) the length of the greatest line that will be contained an integral number of times in both A and B; (ii) the length of the least straight line that will contain both A and B an integral number of times.

[33 marks.]

5. £100 was invested on January 1, 1925, and an equal amount on each succeeding first of January; the money accumulated at $2\frac{1}{2}$ per cent. per annum compound interest. What was the total amount of the fund on December 31, 1929? Give your answer to the nearest penny.

[33 marks.]

6. A man invested £9,000 partly in 3% Stock at $93\frac{1}{2}$, and partly in $4\frac{1}{2}$ % Stock at 102, his total yield from both being 4% per annum. How much did he invest in each Stock?

[33 marks.]

7. A builder contracted to perform a work at a price which would give him a profit of £250. After making the contract wages rose by $12\frac{1}{2}$ %, and the cost of materials by 15%, which reduced his profit to £115. Had wages and cost of materials both increased by 25% he would have made no profit. Find how much he had intended to expend on wages, and how much on material.

[33 marks.]

8. Three spheres of the same material and of radii 2 ins., 3 ins., 5 ins. respectively, are melted and recast as a sphere. Find its radius and its weight, assuming that the smallest of the three spheres weighed 15 lbs.

[34 marks.]

9. A waste-paper basket whose shape is shown in the diagram is 14 ins. high. The internal diameter of the top is 12 ins., and that of the bottom is 9 ins. Calculate the cubic capacity of the basket.

[34 marks.]

