

## TEACHER'S DESK.

J. C. GLASHAN, ESQ., EDITOR.

—Contributors to the 'Desk' will oblige by sending answers with their questions and solutions with their problems. Attention is called to 'Young Teachers' Queries'; other questions of like practical character are solicited, as also are *essays* and *discussions* in answer. The latter should be on separate sheets from any matter intended for the 'Desk' as they will be handed to the General Editors for insertion among "Contributions."

MR. STEWART MOAG. The words *simple* and *compound* seem to have been interchanged in the notice to you in the April No. In the problem the interest is not made payable annually, (mathematically equal to compound interest) but the total interest on each debenture is paid with the debenture. Your view of payment and solution is commercially correct.

## CORRECT ANSWERS AND SOLUTIONS RECEIVED.

Tena. 12, (in part) A. F. B. 4, 6. Jacqueline Fortune and Maggie M. Calder. 4, 10, 11 (sith) 14. Wm. Coutts, Hamilton. 2, 3, 4, 14. A. McIntosh, Pinkerton. 3, 4, 5, 10, 11 (sith) 12 (in part,) 14. Ed. Rowland, Strathroy. 2, 3, 5, 6, 9, 11. Alex. Stewart, Caradoc. 2, 3, 4, 5, 6, 9, 10.

## ANSWERS TO PROBLEMS &amp;C., IN APRIL NO.

Apply the following arithmetical definitions from 'Sanderson's Pelicotetics':

2. "If any thing and any other thing be put together, and to the group thus made another thing be put, and so on, other groups being made successively in the same way by putting to each group made, another thing to make the next following group; and if the things that make up the several groups be viewed only as distinct individual members of the groups, leaving utterly unheeded what the things are, how they are arranged in the groups, and all else; still the groups differ from one another and from the things that make them up, as to what is called the *number* of things in each of them. Accordingly groups so viewed are spoken of as *Different Numbers of Things*, or as *Different Numbers* simply."

(A Fraction will therefore be a group of submultiples of a magnitude.)

3. "A magnitude estimated numerically in reference to a magnitude of the same kind as unit, is called a *Quantity*. The numerical representative of

the ratio of a magnitude to a magnitude of the same kind being the very same as the numerical expression of the former magnitude in reference to the latter as unit, is called a *Numerical Quantity*. A numerical quantity then can only be said to be either a number or a something akin to a number from which there are numbers that differ by less than any assignable number. A numerical quantity is called *commensurable* if a number, and *incommensurable* if not." The square root of 2 is the ratio of the diagonal of a square to a side of the same taken as unit.

4. The gain per cent. means the number of units gained for every hundred units of cost. Here there were not any units of cost, so a hundred units of cost cannot be obtained, or *the problem cannot be solved*. Absolute infinity has been proposed as the gain per cent., but this expression has no place in mathematics except to indicate that the problem has assumed an insoluble form from the vanishing of an essential datum.

5. Equal and opposite horizontal velocities are impressed on the ball, and hence it will have no forward or backward velocity in the line of the train's motion. If gravity is taken into account, the ball will fall vertically.

6. In abstract numbers the unit is absolute, hence the supposition that 6 is 8, (i. e. that 6 is not 6) is impossible, and from such a conditional premise no conclusion can be drawn. Again putting aside this difficulty, the problem is indeterminable, for by the law of the conversion of an arithmetical equivalence, if 6 be 8 then 8 will be 6, and thus every other number (11 included) is undeterminable. The commonly proposed solution by proportion is really that of a very different problem, which in its most general form may be thus stated: If 6 a—units equal 8 b—units, how many b—units will equal 11 a—units? Mr. Alex. Stewart, of Caradoc, was the only contributor who noticed the failure of the problem to fulfil *both* the conditions of such a question.

8. No correspondent has caught the full meaning of this query. It was proposed with the view to call attention to two subjects: The equivalence of forms grammatically distinct, and the verbal identity of orally distinct sentences. The former subject, under the name Changes of Construction, is slightly touched upon in our common grammars, the latter