banished all sense of its culpability, and Miss Helen receives finally as the result of her complaining a severe moral lecture upon her lack of affection for her dear little brother. — (*From March "Home and School."*

TEACHERS' DESK.

J. C. GLASHAN, ESQ., EDITOR.

Contributors to the "Desk" will oblige by observing the following rules:

1. To send questions for insertion on separate sheets from those containing answers to questions already proposed.

2. To write on one side of the paper.

3. To write their names on every sheet.

CORRECT ANSWERS RECEIVED.

R. SHEPHERD, Strathroy; 117, 120.

C. A. BARNES, Ottawa; 117, 119, 120.

D. MCEACHRAN, Ashgrove; 111, 117, 119, 120.

ANSWERS TO CORRESPONDENTS.

H. BEER, Carleton Place. Your method involves division, or its equivalent repeated subtraction. As you will see, you begin at the wrong end.

D. MCEACHRAN. You assume the rod to be homogeneous. There is no need for this; its centre of gravity may be anywhere in it.

YOUNG TEACHER, Paris, Ontario. — Your letter was not handed to us till the "Desk" had been prepared for this month. We shall endeavor to find space to answer you next month.

SOLUTIONS.

117. Let l be the length of the rod, W its weight, w the weight of the beetle, and d the displacement of the common centre of gravity.

Take moments about the original centre of gravity,

$$d(W+w)=lw$$
$$\therefore \ d=\frac{lw}{W+w}.$$

Had the rod been *free* and resting on a smooth horizontal plane, putting D for the displacement of the rod, the equation would become

$$o(W+w)=(l-D)w-DW$$
$$\therefore \ D=\frac{lw}{W+w}.$$

118. $\frac{1}{7} = .142857$ from 7 and 5.

Explanation. Write 7 as a *first multiplicand*. Multiply by 5 (the constant multiplier) equals 35, put down the 5 to the left of the 7 and carry the 3. Multiply the 5 just put down by the constant multiplier 5, add in the carried 3=28, put down the 8 to the left of the 57 and carry the 2. Multiply the 8 just put down by 5 add in the carried 2=42, put down the 2 to the left of the 857 and carry 4. Multiply the 2 just put down by 5, add in the carried 4=14, put down the 4 to the left of the 2857, and carry 1. Multiply the 4 just put down by 5, add in the carried 1=21, put down the 1 to the left of the 42857 and carry 2. Multiply the 1 just put down by 5, add in the carried 2=7,——stop, *you have returned to the first multiplicand.* Write the number 142857, you have thus formed, as a pure circulating decimal.

For 5-13ths, the *first multiplicand* is 5, the *constant multiplier* is 4, and there is a carried 1. Proceed in like manner as before until you get a product 15, which do not use as it would give a multiplicand 5 with a carried 1. Thus we get

5-13ths equals .384615 from 5 and 4 with carried 1.

For 7-19ths the first multiplicand is 7 and the constant multiplier is 2, thus we get

7-19ths =.368421052631578947 from 7 and 2.

For 3-23rds the first multiplicand is 9 and the constant muliplier is 7, thus we get

3-23rds=.1304347826086956521739 from 9 and 7.

Similarly any other fraction may be reduced to a decimal, the calculation *beginning at the right hand side* of a period if there be one, of the complete decimal if there be no period. For the present we leave it to the ingenuity of our readers to find out the theory of the process and the method of finding the first multiplicand, and the constant multiplier, merely remarking in passing that they are found by addition or its mnemonical form multiplication, there being no subtraction or division anywhere in the process. Further they can be found instantly and mentally by any one acquainted with the multiplication table.