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.

JAMES STEWART and ROBT. SHARP, pupils of P. S. No. 8, Ancaster; 76.
HARRY FERRETT, pupil of Florence School; 82.
G. T. AMSDEN, " " "; 82, 83.
ALEX. MCINTOSH, Pinkerton; 77, (78, 79.)
CON. O'GORMAN, White Lake; 81, 82, 83.
JAS. E. FRITH, Vandecar; 81, 82, 83.
W. S. HOWELL, Belleville, 73, 75, 76, 77.
HENRY ROSE, Montague; 83.
GEOREG G. MELDRUM, Grand Bend; 82, 83.
W. C. BRADSHAW, Everett; 81, 82, 83.
ROBT. GIBSON, Komoka; 81, 82, 83.
HENRY GRAY, Sombra; 80, 81, 82, 83.
R. SHEPHERD, Wyoming; 80, 81, 82, 83.

ANSWERS TO CORRESPONDENTS.

ALEX. MCINTOSH. Your answer to 77 is in leagues.
J. DUNHAM. The volume of water is too great.
W. S. HOWELL. Your solution of 73 was excellent.

ANSWERS TO PROBLEMS.

80. A rent of £10 would be rated at £7, on which the rates at 3s in the pound would be 21s; for a rateable value of £7 the estimated annual value would be £10+21s=£11 1s.

Now £884 is £11 1s repeated 80 times $\therefore$ the rateable value will be £7 repeated 80 times or £560.

81. All correspondents solved this problem by *symbolic arithmetic* essentially thus,

1.8 *p.c.* of M+1.8 *p.c.* of F= 9.8 *p.c.* of F −4.6 *p.c.* of M.
$\therefore$ 6.4 *p.c.* of M=8 *p.c.* of F;
$\therefore$ 4×M=5×F;
$\therefore$ M : F :: 5 : 4.

The solution by *graphic arithmetic* is as follows:
1° year. Arrange the males, (dots) in rows of 1000 each
1° year. Arrange the females, (crosses) in rows of 1000 each.
2° year: Arrange the males in the same number of rows as there were in the 1° year, there will be 954 in each row. Similarly arrange the females, there will be 1098 in each row.

Take 80 off the first row of females leaving 1018 in the row.

Stand 64 of the 80 at the end of the first row of males increasing this row to 1018 prisoners.

Stand the remaining 16 of the 80 at the end of the back row of males.

Repeat with 3 more rows of females; there will be 4 rows of females reduced to 1018 each, the 4 front rows of males will be increased to 1018 each, and 4 additions of 16 females each will have been added to the back row of males, but these will increase it also to 1018 prisoners, or the reductions on 4 rows of females will *even up* 5 rows of males. Now by the problem there were exactly enough rows of females to even up all the rows of the males, hence there must have been 5 rows of males to every 4 rows of females, and therefore, the 1° year when the rows of males and females were respectively, the same length, the males were to the females as 5 to 4.

This solution easily yields an answer to the question "What was the least possible number of prisoners?" The shortest rows possible to use will be instantly seen to be 500 each, therefore, the least numbers will be 2500 males and 2000 females.

82. The shillings are 'so many times' worth the box; the sovereigns are 'as many times' worth the shillings, therefore, the sovereigns are 'as many times' 'so many times' worth the box or the 'so many times' is taken as the unit of value and multiplied by itself. Now 5832 sovs.=116640*s.* which divided by 2*s.* 6*d.* gives 46656 as the 'times' that the sovs. are worth the box. The square root of this, is the 'no. of times' which multiplied by itself will give this, or is the 'no. of times' that the shillings are worth the box. But the square root is 216, therefore the shillings are 216 times 2*s.* 6*d.* or 540*s.*

By graphic arithmetic,—Change your sovereigns into half-crowns, there will be 46656. Arrange these in a square, there will be 216 rows each containing 216 half-crowns. The whole square is worth the sovereigns, a row is worth the shillings, and one half-crown is worth the box, and since there are as many rows in the square as half-