

TEACHERS' DESK.

J. C. GLASHAN, ESQ., EDITOR.

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

1st. To send answers with their questions and solutions with their problems.

2nd. To send questions for insertion on separate sheets from those containing answers to questions already proposed.

3rd. To write on one side of the paper.

4th. To write their names on every sheet.

ANSWERS TO CORRESPONDENTS.

IOTA. Will write you.

A. DICKINSON. It would need a figure. Will write you.

C. INNES. Thirty-two days.

A. MCINTOSH. Accept our thanks.

CORRECT ANSWERS AND SOLUTIONS RECEIVED.

W. Pierce, Brinsley, 54.

Mary Weatherston, Westminster, 53, 54.

E. L. White, Addison, 53, 55 (a).

John Cushnie, Holstein, 53, (Text-Book view), 54, 55 (a)

W. S. Howell, Belleville, 53, 54 & 57.

A. McIntosh, Pinkerton, 53, 54, 56, 57.

ANSWERS TO QUESTIONS.

53. The question in dispute is "When is a race finished, when the winner comes in, or when the last *not distanced* passes the winning post?"

The former alternative is generally applied to foot-races, both are applied to horse-races, the latter notably in the Derby. The text-book assumes the latter, but overlooks, 1st. That it is applied only in timing not in spacing, for which only the former is applied and 2nd, D was distanced by the rules of the clubs adopting the latter method.

The solution by common Canadian racing rules may be exhibited thus,—

	A	B	C	D
	1760 while	1740;	1760,	1700
and	1760 while	1720	
	1700	1760	1700	
∴	of	of	of	of
	1720	1740	1720	1760, 1760, 1700
	44	85	1	2
A runs	of	of	1760 =	(1 + $\frac{1}{43}$) (1 - $\frac{2}{87}$)
	87	43	43	87
	87 - 86	2	1760	
1760 =	(1 + $\frac{43+87}{43+87}$)	-	1760 =	$\frac{3741}{3741}$ yards
short of the mile.				

54. This is a thoroughly practical problem, one that any teacher is constantly liable to have proposed to him for business purposes, e.g. in case of a section borrowing money to build a school-house. The formula for solution is given in "Annuities," Sangster's National Arithmetic, page 361 No. VI. Ans. \$149.03 and \$490.30.

55. For the sake of those preparing for First Class Certificates we give general formulae because they contain in themselves hints for the method of their deduction. No correspondent managed the latter part of the problem. A continual-acting velocity-destroyer will act as gravity does in generating velocity.

Let s = span of bridge in feet, (87.)

Let f = fall of engine in feet, (25 41-48ths.)

Let l = time of engine in leap.

Let g = velocity generated by gravity per second, (32.)

Let v = horizontal velocity of engine in feet per second, neglecting air-resistance.

Let w = horizontal velocity taking account of air-resistance.

Let r = ratio of velocity-destroying force from air-resistance to whole force. (1-9th.)

e = base of Napierian system of Logarithms.

(a) $f = \frac{1}{2} g t^2$ and $S = v t$.

(b) $f = \frac{1}{2} (1 - r) g t^2$ and $e^r S = v t$.

Substitute the given values of s, f, g, r , and eliminate t . To reduce to miles per hour $\times 15 \div 22$, (the ratio of the number of seconds in an hour to the number of ft. in a mile). Ans. (a) 46.66 miles per hour, (b) 49.16 miles per hour.

ON THE MIDDLE VOICE.

(Continued.)

What is the Middle Voice and whence the name? In Sanskrit there were three formal voices, or voices formed by suffixes (inflections); these were the Active called "affecting another"; the Reflective, called "self-affecting," and the Passive. The Active was distinguished from the others, by its endings, the Passive by inserting ya (= go), between the ending and the root. In Greek all the tenses but one or two in each mood of the Passive, were lost and their places were supplied by the corresponding tenses of the reflexive. At the same time these reflexive forms retained in many verbs more or less of their reflexive force and consequently the Greeks had forms of the verb which