SCHOOL HOLIDAYS.

It is well that teachers should clearly understand that, if the length of the summer vacation in rural schools is not distinctly stated in their agreements, according to a decision of the Minister of Education the trustees can compel them to give only the shortest time which the law allows. This seems unjust. The law specifies that the holidays shall continue six weeks, but gives permission to trustees to reduce the time to four weeks. Six weeks is the rule, four the exception. Surely a fair interpretation would not subordinate the rule to the exception. If trustees fail to insert a short-holiday clause in their agreement, the law, not the exception, should prevail.

Mr. Crooks stated, when the objectionable amendment was introduced, that if it was found that only a small number took advantage of its provisions, he would propose its repeal. We are glad to know that the good sense of the people has in nearly all cases led them to follow the common sense suggestions made by the medical gentlemen in Parliament: to lengthen rather than shorten the holidays. Mr. Crooks will doubtless soon 'ee his way to remove the provisional amendment from the statutes. He, no doubt, adopted the most practical means for silencing those radical grangers who arrogantly claimed to legislate for the country—in granting what they asked, that they might see how greedily selfish they were. Many of them were even angry because their request was granted, because they lost what might have made a first-class grievance.

—In a recent circular from the Education Department of England to the Inspectors of schools, the following instruction is given: "You will oppose the appointment of sickly precocious children as pupil teachers, and you will insist upon good health as an essential qualification for those who aspire to the teacher's office." This is a wise provision. "Make John a merchant, because he is shrewd; Tom is a clever talker and holds his own in an argument, we should make a lawyer of him; William is a thoughtful, clear-headed boy, he would make a good preacher; but poor Ned is weakly, I suppose there is nothing for it but to make him a teacher." Too long this was the reasoning of fond parents in planning for their sons. The "new profession" needs the best talent, the warmest hearts, and the healthiest bodies in the community.

—Mr. Ryerson, at present Mathematical Master in Barrie Collegiate Institute, has been appointed to the Headmastership of Orillia High School. From Mr. Ryerson's reputation as a successful and enthusiastic teacher, we can congratulate the Orillia Board upon its choice.

—Mr. Sprague, for many years Principal of Model School, Cobourg, is about to retire from the teaching profession to begin the study of medicine. Mr. Sprague will be succeeded by Mr. Kirk, of Campbellford, who has the reputation of being a most successful and efficient teacher.

Mathematical Department.

SOLUTIONS TO EXAMINATION PAPERS, JULY, 1881.

FIRST CLASS, GRADE C.

ARITHMETIC.

1. The rule holds for both cases.

"The sum of the digits of any number divided by 9 leaves the same remainder as the number itself divided by 9."

See H. Smith's Arithmetic, page 34.

The sums of the lines, taken either vertically or horizontally, must equal the sum total. But the sum of each line contains 9 a certain number of times with a remainder. And the sum of all these remainders must contain 9 a certain number of times with a remainder. Now it is evident that the sum of all the multiples of 9 in the lines must equal the multiple of 9 in the sum total, and the final remainder equal to the remainder from the sum total. The usual exceptions will of course apply—transposition of figures, etc.

2. $\frac{1}{2}(\frac{3}{4}\ cost) + \frac{2}{3}(\frac{5}{8}\ cost) + \frac{1}{10}(\frac{1}{2}\ cost) = \$1125.$
$\therefore\ cost = \$1000.$

3. Let x be the radius of the piston in the second case. We may then state the question thus:—

If 4 pumps.................... 6
With 3ft. stroke 4
And $\pi(3)^2$ piston area .... πr^2
Raise 6^3 cubic ft. water.......... 3^3
In 1 hour..................... $\frac{6}{5}$
Using 100% of the work ....90%.

Hence, by proportion, we have the statement :—

$$\begin{matrix} 6:&4\\ 4:&3\\ 216:&27\\ 5:&8\\ 9:&10\end{matrix}\Bigg\} :: 3^3:x^3.$$

$\therefore\ x^3 = \dfrac{9\times4\times3\times27\times8\times10}{6\times4\times216\times5\times9} = 1 \qquad \therefore\ x = 1\ \text{inch.}$

The analytical solution is obvious.

4. (P. W. of \$90 due in 40 days) + (P. W. of \$90 due in 101 days)
$= \frac{98}{100}$ of \$180,

or (P. W. of \$1 due in 40 days) + (P. W. of \$1 due in 101 days)
$= \frac{196}{100}.$

Let r = rate per annum $\therefore\ \dfrac{r}{100}$ = rate per \$.

$\therefore\ \dfrac{40r}{36500}$ and $\dfrac{101r}{36500}$ are the interests of \$1 for 40 and 101 dys.

Hence,

$\dfrac{40r}{36500+40r}$ and $\dfrac{101r}{36500+101r}$ are the discts. of \$1 for 40 and 101 dys.

$\dfrac{36500}{36500+40r}$ and $\dfrac{36500}{36500+101r}$ are the P. W's of \$1 for 40 and 101 dys.

See H.' Smith's Arithmetic. Can. Ed. App. page 334.

Hence we have,

$$36500\left\{\dfrac{1}{36500+40r} + \dfrac{1}{36500+101r}\right\} = \dfrac{196}{100}$$

i.e., $2\times36500^2 + 36500\times141r = \frac{196}{100}\{36500^2 + 36500\times141r + 4040r^2\}$

$(\frac{196}{100}\times4040)r^2 + (\frac{96}{100}\times36500\times141)r - \frac{4}{100}(36500^2) = 0,$

or, $\left(\dfrac{49\times101}{3650}\right)r^2 + (6\times141)r - 9125 = 0$

$\therefore\ r = 10\cdot58+$

5. Apparent assets $= \frac{1}{4}$ liabilities. He loses \$4000 of the apparent assets. Hence,

$(\frac{1}{4}$ liabilities $- \$4000)\frac{90}{100} = \frac{60}{100}$ liabilities,

i.e., liabilities $= \$228571\frac{3}{7}.$

The apparent assets $= \$182855\frac{4}{7}$, which is less than \$20000, and the given data are, therefore, incompatible.

6. A loses interest on \$210 from May 11th to June 11th.

B has the use of \$210 for 1 month, and \$205 for 4 months = use of \$1030 for 1 month = \$$\frac{85}{12}$ for 1 year.