or be deceived that it is only a question for the Episcopal Church, or for the Presbyterian Church, or any other so called church; but is plainly and emphatically the question for the Christian Church—Roman Catholic and Protestant. Let us quit ourselves as men who have a great problem on hand requiring all the wisdom, devotion and charity of the sons and daughters of all the preceding generations of Christian workers.

SCHOOL WORK.

MATHEMATICS.

ARCHIBALD MACMURCHY, M.A., TORONTO. EDITOR.

EDUCATION DEPARTMENT, ONTARIO.

MIDSUMMER EXAMINATIONS, 1888.

Junior Matriculation.

MEDICINE, ALGEBRA AND ARITHMETIC. HONORS.

1. $$\frac{3987.63}{\frac{106}{100}\times\frac{106}{100}\times\frac{103}{100}}=\$3,250.57+$$

2. Book work.

3. Least Common Dividend of 113.002 and 89.604 is $\frac{113.004\times 89.604}{.002}$

$\therefore$ Least number of sovs. $=$

$$\frac{113.004\times 89.604}{.002}\div 113.004 = 44802\ \textit{Ans.}$$

4. If the number be a multiple of 10 we know that if it be divisible by 9 the significant figures must be; hence the last digit in the quotient would be 0, which, added to the 0 in the dividend, would produce 0 (not 10), therefore the case fails.

Again, since $9+1=10$, it follows that any number added to 9 times itself produces 10 times itself, that is a multiple of 10, hence the sum of the unit digits must be 10.

5. Expression

$$=\frac{-(b-c)\ [bc-(b+c)\,k+k^2\ ]\ +\ \&c.,\ +\ \&c.}{(a-b)\ (b-c)\ (c-a)}$$

$$=\frac{\begin{array}{llll}-(b-c)\,bc+ & (b^2-c^2)\,k- & (b-c)\,k^2+ & \\ \&c. & \&c. & \&c. & + \\ \&c. & \&c. & \&c. & \end{array}}{(a-b)\ (b-c)\ (c-a)}=$$

$$\frac{-bc\,(b-c)\ -ca\,(c-a)\ -ab\,(a-b)}{(a-b)\ (b-c)\ (c-a)}=1.$$

6. Putting $x^2=y^2$ in numerator we find x^2-y^2 is a factor; $\therefore$ also y^2-z^2 and z^2-x^2.

Same way in denominator, $x-y$ is a factor; $\therefore$ also $y-z$ and $z-x$.

Expression becomes

$$-\frac{(x^2-y^2)\ (y^2-z^2)\ (z^2-x^2)}{-(x-y)\ \ (y-z)\ \ (z-x)}$$
$$=(x-y)\ (y-z)\ (z-x).$$

7. If m and n are roots of $ax^2+bx+c=0$.

$$m+n=-\frac{b}{a}$$
$$mn=\frac{c}{a}$$

(*a*) $$m^3+n^3+3mn\,(m+n)=-\frac{b^3}{a^3}$$
$$m^3+n^3=-\frac{b^3}{a^3}+\frac{3bc}{a^2}=\frac{3abc-b^3}{a^3}.$$

(*b*) $$\frac{1}{m}+\frac{1}{n}=\frac{m+n}{mn}=\frac{-\frac{b}{a}}{\frac{c}{a}}=-\frac{b}{c}$$

(*c*) $$ax^2+bx+c=a\left(x^2+\frac{b}{a}\,x+\frac{c}{a}\right)=$$
$$a\,(x^2-\overline{m+n}\,x+mn)=$$
$$a\,(x-m)\ (x-n).$$

7. (1) $xz+yz=c,\ xy+xz=a,\ yz+xy=b.$
Add (1) and (2) and subtract (3);

$$2xz=c+a-b$$
also $2yx=a+b-c$
also $2zy=b+c-a$

$$(1)\ xz=\frac{c+a-b}{2}$$

$$(2)\ yx=\frac{a+b-c}{2}$$