memory as her most illustrious founder. Indeed, the good doctor, in some of his ornate convocation addresses, used to refer to himself as having rocked the cradle of the "benign mother" during the troublous times of her infancy, and gloried in seeing her grow up before his eyes, stately and fair, to lusty womanhood. Of the beloved institution with which he was so long and so successfully identified he was at all times the ornament and the boast, at once her glory and her defence—*decus et tutamen.* His best eulogy is written in the affection and esteem of his pupils everywhere.

Of Dr. McCaul's numerous classical works, the most valuable are his edition of the Satires and Epistles of Horace and his recondite researches in Greek and Roman Epigraphy. His "Britanno-Roman Inscriptions" attracted the attention of European scholars and won for him a deservedly high reputation. Trinity College, Dublin, may well cherish the memory of her illustrious son, and crown him in her fasti, as she has often crowned him before, as one of her most distinguished alumni. The teaching faculty of Ontario for generations will hold his name in honoured remembrance.

SCHOOL WORK.

MATHEMATICS.

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

SOLUTIONS TO PROBLEMS IN MAY NUMBER.

By GEO. RIDDELL, B.A., Math. Master, Galt Coll. Inst.

57. (1) Solve $x^4+1=0$, divide by x^2 and add 2 $x^2+2+\frac{1}{11^2}=2,\ x+\frac{1}{11}=\pm\sqrt{2}$

$$\therefore\ x=\pm\frac{1\pm\sqrt{-1}}{\sqrt{2}}.$$

(2) $x^4+1=d(x^4+4x^3+6x^2+4x+1)$ dividing by x^2 and arranging

$$\left((x^2+\frac{1}{x^2}\right)(1-d)-\left(x+\frac{1}{x}\right)(1+4d)-6d=0.$$

$$x^2+\frac{1}{x^2}-\frac{4d}{1-d}\left(x+\frac{1}{x}-\frac{6d}{1-d}\right)=0,$$

add and subtract 2.

$$\left(x+\frac{1}{x}\right)^2-\frac{4d}{1-d}\left(x+\frac{1}{x}-\frac{4d+2}{1-d}\right)=0.$$

$$x+\frac{1}{x}=\frac{2d\pm\sqrt{2(1+d)}}{1-d},\ \text{etc.}$$

58. a and β are the roots of $x^2-px-q=0$, either $x=a$ or $x=\beta$, then

$$x^n=\frac{a^n-\beta^n}{a-\beta}x+\frac{a^{n-1}-\beta^{n-1}}{a-\beta}q \text{ becomes}$$

$$\text{either } a^n=\frac{a^n-\beta^n}{a-\beta}a+\frac{a^{n-1}-\beta^{n-1}}{a-\beta}(-a\beta),$$

$$\text{or } \beta^n=\frac{a^n-\beta^n}{a-\beta}\beta+\frac{a^{n-1}-\beta^{n-1}}{a-\beta}(-a\beta)$$

both of which are identities, wherefore, etc.

59. The series is 1, 3, 5, 7......$2n-1$, and since $S_n=n^2$, $S_{n-1}=(n-1)^2$,

$$S_{n-1}+(n^{th}\ \text{term})=S_n,$$

$$\therefore\ (n-1)^2+2n-1=n^2;$$

whenever $(2n-1)$ is a square number we have an integral solution of $x^2+y^2=z^2$, the odd square numbers are $3^2, 5^2, 7^2$, etc., $\therefore\ 2n-1=9, 25, 49$, etc.,

$n=5, 13, 25$, etc.,

$4^2+3^2=5^2,\ 12^2+5^2=15^2,\ 24^2+7^2=25^2$, etc.

60. Let $a=x+(p-1)d$, also $a=my^{p-1}$

I. $b=x+(q-1)d$, II. $b=my^{q-1}$

$c=x+(r-1)d$, $c=my^{r-1}$

from I. $a-b=(p-q)d$

$b-c=(q-r)d$, $\therefore\ a^{b-c}, b^{c-a}, c^{a-b}=$

$c-a=(r-p)d$, $a^{(q-r)d}, b^{(r-p)d}, c^{(p-q)d}=$