KEY TO ALGEBRA. FOR THE USE OF COLLEGES AND SCHOOLS

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I. TODHUNTER

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THE Key to *Algebra for the Use of Colleges and Schools* has been published in consequence of applications from teachers and students. It is hoped that the Key will be acceptable to teachers by saving much of the time and trouble which they have to employ in correcting the mistakes of their pupils; and that it will be serviceable to those who enter on the study of Algebra without assistance, by affording them guidance and encouragement. The examples have been solved in the most simple and natural manner, in order to meet the difficulties which are most likely to occur; and the processes are given with sufficient detail to render them easily intelligible.

I. TODHUNTER.

ST JOHN'S COLLEGE,
November, 1870.

KEY

TO

ALGEBRA FOR COLLEGES AND SCHOOLS.

I.

1. $1+6+16=23.$
2. $9+30-4=35.$
3. $3+24+36=63.$
4. $4+96-12=88.$
5. $12+72+8-0=92.$
6. $1+9+16+0=26.$
7. $\frac{24}{3}+\frac{24}{8}-\frac{24}{24}=8+8-1=15.$
8. $256-256+12-6=6.$
9. $\frac{9+16}{8-3}=\frac{25}{5}=5.$
10. $\frac{216-64}{36+24+16}=\frac{152}{76}=2.$
11. $\sqrt{81}-\sqrt[3]{8}+\sqrt{4}=9-2+2=9.$
12. $\sqrt{36}+\sqrt[3]{216}-\sqrt[3]{8}=6+6-2=10.$
13. $(9-5)(3+1)+(3+5)(5+7)-112=4\times4+8\times12-112$
$=16+96-112=0.$
14. $5\sqrt{(25-24)}+3\sqrt{(25+24)}=5\sqrt{1}+3\sqrt{49}=5+3\times7=5+21=26.$
15. $3\sqrt{(25-24)}+5\sqrt{(25+24)}=3\sqrt{1}+5\sqrt{49}=3+5\times7=3+35=43.$
16. $10+8\sqrt{(12+4)}-(10-8)\sqrt[3]{(12-4)}=10+8\sqrt{16}-2\sqrt[3]{8}$
$=10+8\times4-2\times2=10+32-4=38.$
17. $(10-5)(\sqrt{16}+10)+\sqrt{\{(16-10)(5+1)\}}=5(4+10)+\sqrt{\{6\times6\}}$
$=5\times14+6=70+6=76.$
$(16-1)\{\sqrt{100}+25\}+\sqrt{\{(16-5)(10+1)\}}$
$=15(10+25)+\sqrt{(11\times11)}=15\times35+11=525+11=536.$
18. $\sqrt[3]{\{(2+3)^3\times5\}}+\sqrt{\{(2+6)(5-4)\}}+\sqrt[3]{\{(5-3)^3\times2\}}$
$=\sqrt[3]{(5^3\times5)}+\sqrt[3]{8}+\sqrt[3]{\{2^3\times2\}}=5+2+2=9.$

II.

5. $4ab-x^2+3x^2-2ab+2ax+2bx=2ab+2x^2+2ax+2bx.$
6. $5a-3b+4c-7d-\{2a-2b+3c-d\}=5a-3b+4c-7d-2a+2b-3c+d$
$=3a-b+c-6d.$
7. $x^4+4x^3-2x^2+7x-1-\{x^4+2x^3-2x^2+6x-1\}$
$=x^4+4x^3-2x^2+7x-1-x^4-2x^3+2x^2-6x+1=2x^3+x.$
8. $3a^2-2ax+x^2-\{a^2-ax+x^2\}=3a^2-2ax+x^2-a^2+ax-x^2=2a^2-ax.$
9. $2(a-b)-c+d-\{a-b-2(c-d)\}=2a-2b-c+d-\{a-b-2c+2d\}$
$=2a-2b-c+d-a+b+2c-2d=a-b+c-d.$