FIRST COURSE IN ALGEBRA. THEACHERS` EDITION

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Trieste

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TEACHERS' EDITION

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PREFACE

The busy teacher of high-school algebra often finds that limitations of time forbid the actual working out of all the exercises and problems in a text. This teachers' edition is designed to meet such a condition. In its plan it is brief and schematic rather than complete and detailed. Less time should be required to prepare a lesson from this outline than from a text giving the solutions in full.

For those exercises involving not more than one process in their solution the answers only are given. If two or more processes are required in a solution, an outline is given which covers each step of the work. Moreover, after each indicated step of the work, the result obtained by taking that step is set down. This scheme affords an easy method of tracing a solution.

In the solution of problems the meaning of each letter representing an unknown is clearly stated, the equations representing the conditions of the problems in terms of these letters are given, and the schematic solution of the equation or system always follows.

The authors and publishers desire the coöperation of teachers and school authorities in limiting the circulation of this book to actual teachers of algebra.

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Page 1

1. $4h + 3m = 4(3600) + 3(60) = 14{,}580$ seconds.
2. $5y + 4f = 5(36) + 4(12) = 228$ inches.
3. $4q + 6d = 4(25) + 6(10) = 160$ cents.
4. $4t + 6h = 4(2000) + 6(100) = 8600$ pounds.
5. $3x + 5x = 8x$.
6. $4x + 5x = 9x$.
7. $2x + 3x + 6x = 11x$.
8. $2x + 2 + 3x + 4 = 5x + 6$.
9. $x + x + 2 + x + x + 2 = 4x + 4$.
10. $n + n + 1 + n + 2 = 3n + 3$.
11. $5a + 18 - 3a - 7 = 2a + 11$.
12. $8x - 3 + 18 - 5x = 3x + 15$.
13. $4w - 8 + 3w + 20 = 7w + 12$.
14. $y + 5m = 17m$.
15. $2y + 7f = 13f$.
16. $4q + 3n = 23n$.
17. $2d + 15h = 63h$.
18. $15h + 50m = 950m$.

19. Area, $5 \cdot 5 \cdot 1$ square inch $= 25$ square inches; perimeter, $4 \cdot 5$ inches $= 20$ inches.

20. Perimeter, $4s$ inches; area, $s \cdot s$ square inches.

21. Area, $12 \cdot 4 \cdot 1$ square foot $= 48$ square feet; perimeter, $2 \cdot 12$ feet $+ 2 \cdot 4$ feet $= 32$ feet.

22. Area, ab square feet; perimeter, $2a$ feet $+ 2b$ feet $= (2a + 2b)$ feet.

23. (*a*) $2x$ inches; (*b*) $2 \cdot x + 2 \cdot 2x = 6x$ inches; (*c*) $2x \cdot x$ square inches.

24. $3 \cdot y$ years.

25. $(30 + y)$ years.

26. Length, $(12 + w)$ feet; perimeter, $w + w + 12 + w + 12 + w = (24 + 4w)$ feet.

27. Length, $(18 + w)$ feet; perimeter, $w + w + 18 + w + 18 + w = (36 + 4w)$ feet.

28. *Let* w feet $=$ the width.

Then $2w + 4$ feet $=$ the length,

and the perimeter $= w + w + 2w + 4 + 2w + 4$,

$= (6w + 8)$ feet.

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1. Greater number + less number = 160.

If we represent the less by l, then $4l$ must represent the greater, and the above statement becomes

$$4l + l = 160.$$

Whence $l = 32,$

and $4l = 128.$

Therefore the greater number is 128 and the less is 32.

2. The number + five times the number = 216.

If we represent the number by n, the above statement becomes

$$n + 5n = 216,$$

or $6n = 216.$

Whence $n = 36.$

3. Greater number + less number = 72.

If we represent the less by l, then $7l$ must represent the greater, and the above statement becomes

$$7l + l = 72.$$

Whence $l = 9,$

and $7l = 63,$

4. 1st number + 2d number + 3d number = 105.

If we let t represent the 3d number, $2t$ must represent the 1st number and $4t$ the 2d. Then the above statement becomes

$$2t + 4t + t = 105.$$

Whence $t = 15,$

$2t = 30,$

and $4t = 60.$

5. 1st number + 2d number + 3d number = 117.

If we represent the 1st number by n, $2n$ must represent the 2d number and $6n$ the 3d. Then the above statement becomes

$$n + 2n + 6n = 117.$$

Whence $n = 13,$

$2n = 26,$

and $6n = 78.$

6. 1st number + 2d number + 3d number = 192.

If we represent the 2d number by n, $2n$ must represent the 1st number and $3n$ the 3d. Then the above statement becomes

$$2n + n + 3n = 192.$$

Whence $n = 32,$

$2n = 64,$

and $3n = 96.$

7. 1st number + 2d number + 3d number = 324.

If we represent the 1st number by n, $5n$ must represent the 2d number and 30 the 3d. Then the above statement becomes

$$n + 5n + 30n = 324.$$

Whence $n = 9,$

$5n = 45,$

and $30n = 270.$

8. 1st number + 2d number + 3d number = 104.

If we represent the 1st number by n, $3n$ must represent the 2d number and $4n$ the 3d. Then the above statement becomes

$$n + 3n + 4n = 104.$$

Whence $n = 13,$

$3n = 39,$

and $4n = 52.$

10. From arithmetic, principal + interest = amount.

Principal + .06 principal = \$265.

If p represents the principal, this last statement becomes

$$p + .06p = 265.$$

Whence $p = 250.$

Therefore the sum is \$250.

11. Principal + .12 principal = \$700.

If p represents the principal, the above statement becomes

$$p + .12p = 700.$$

Whence $p = 625.$

Therefore the required sum is \$625.

12. $225 \times .06 \cdot$ (number of years) = 27.

If we represent the number of years by n, this statement becomes

$$225 \times .06 \cdot n = 27,$$

or $13.5n = 27.$

Whence $n = 2.$

13. $520 \times .065 \cdot$ (number of years) = 169.

If n represents the number of years, this statement becomes

$$520 \times .065 \cdot n = 169,$$

or $33.8n = 169.$

Whence $n = 5.$

15. Let $x =$ the rate of interest.

Then $\$825x =$ the interest for one year,

and $\$3300x =$ the interest for four years.