BATTLE SHEET · CHAPTER 2

Solving Linear Equations

MathBound Standard Algebra 1 · Island 2: Brasswing Bluffs

Name _____ Class _____ Date _____

The foes of Brasswing Bluffs are out, and each one fights with its own kind of Algebra 1 problem. **Defeat each foe by solving its problems.** Show your work in the space on each card, then circle the letter of your answer.

The foes on this sheet



Tip-Scale Tot

A little scale that keeps both sides level: one-step equations.

Problems 1–2 · Lesson 2.1 · Battle it online: **play.mathbound.org/alg1/?practice=r2.addition-and-subtraction-properties**



Fraction Washer

Washes the fractions out of an equation: equations with fractions and decimals.

Problems 3–4 · Lesson 2.2 · Battle it online: **play.mathbound.org/alg1/?practice=r2.fractions-and-decimals**



Side Sweeper

Sweeps everything to one side: variables on both sides.

Problems 5–6 · Lesson 2.3 · Battle it online: **play.mathbound.org/alg1/?practice=r2.variables-on-both-sides**



Mirror Twins

Two halves that mirror each other: absolute value equations have two answers.

Problems 7–8 · Lesson 2.4 · Battle it online: **play.mathbound.org/alg1/?practice=eq.absolute-value**



Recipe Rover

Follows a recipe card of flasks: using formulas and solving for a variable.

Problems 9–10 · Lesson 2.5 · Battle it online: **play.mathbound.org/alg1/?practice=r2.formulas**



Cash-Till Cassie

A rolling cash register with a sale tag: percents, discounts and interest.

Problems 11–12 · Lesson 2.6 · Battle it online: **play.mathbound.org/alg1/?practice=r3.percent-applications**



Clue Ticker

A clockwork detective who reads every clue: turning words into equations.

Problems 13–14 · Lesson 2.7 · Battle it online: **play.mathbound.org/alg1/?practice=r3.problem-solving-strategy**

> **For teachers.** 14 problems from MathBound's own question engine, on chapter 2 of MathBound Standard Algebra 1. The answer key, with worked steps, is at the end. Free to copy for your classes.
>
> Every foe here is also a battle in MathBound, the Algebra 1 adventure game: free for students, no sign-up, at **play.mathbound.org**. The link under each foe opens practice battles with it. Classes, progress by skill and assignments: **mathbound.org/teachers**.

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FOE 1 OF 7

Tip-Scale Tot

A little scale that keeps both sides level: one-step equations. Lesson 2.1. Battle it:
play.mathbound.org/alg1/?practice=r2.addition-and-subtraction-properties

1 Lesson 2.1

Which value is the solution to $4x + 1 = 3x + 3$?

A. -2 **B.** 2
C. 1 **D.** 3

WORK

2 Lesson 2.1

Translate and solve: -2 less than y is -10.

A. -12 **B.** -8
C. 8 **D.** 12

WORK



FOE 2 OF 7

Fraction Washer

Washes the fractions out of an equation: equations with fractions and decimals. Lesson 2.2. Battle it:
play.mathbound.org/alg1/?practice=r2.fractions-and-decimals

3 Lesson 2.2

Solve: $9 = \frac{x}{4} + 6$

A. 0.75 **B.** 12
C. 3 **D.** 36

WORK

4 Lesson 2.2

Solve: $-0.5x + 0.5 = 0.5x + 7.5$

A. -1 **B.** -7
C. -8 **D.** 7

WORK



FOE 3 OF 7

Side Sweeper

Sweeps everything to one side: variables on both sides. Lesson 2.3. Battle it:
play.mathbound.org/alg1/?practice=r2.variables-on-both-sides

5 Lesson 2.3

Solve: $3x = x + 20$

A. 10 **B.** 5
C. 20 **D.** 2

WORK

6 Lesson 2.3

Translate and solve: The negative of a number is 20 more than 4 times the number.

A. -5 **B.** -4
C. 6.667 **D.** 4

WORK

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FOE 4 OF 7

Mirror Twins

Two halves that mirror each other: absolute value equations have two answers. Lesson 2.4. Battle it:
play.mathbound.org/alg1/?practice=eq.absolute-value

7 Lesson 2.4

Omar solved $|x + 8| = 3$ and gave $x = -5$ as the only answer. What is the complete solution?

A. $x = -11$ or $x = -5$

B. $x = 5$ or $x = 11$

C. $x = -5$

D. $x = -5$ or $x = 5$

WORK

8 Lesson 2.4

Solve: $|x - 5| = 2x - 7$

A. $x = 4$

B. no solution

C. $x = 2$

D. $x = 2$ or $x = 4$

WORK



FOE 5 OF 7

Recipe Rover

Follows a recipe card of flasks: using formulas and solving for a variable. Lesson 2.5. Battle it:
play.mathbound.org/alg1/?practice=r2.formulas

9 Lesson 2.5

Find V if $l = 12, w = 8$ and $h = 6$, using $V = lwh$.

A. 576

B. 96

C. 26

D. 102

WORK

10 Lesson 2.5

Solve $F = \frac{9}{5}C + 32$ for C.

A. $C = \frac{5}{9}(F - 32)$

B. $C = \frac{5}{9}(F + 32)$

C. $C = \frac{9}{5}(F - 32)$

D. $C = \frac{5}{9}F - 32$

WORK

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FOE 6 OF 7

Cash-Till Cassie

A rolling cash register with a sale tag: percents, discounts and interest. Lesson 2.6. Battle it:
play.mathbound.org/alg1/?practice=r3.percent-applications

11 Lesson 2.6

A school has 300 students, and 10% of them ride the bus. How many students ride the bus?

A. 30 **B.** 270

C. 3000 **D.** 10

WORK

12 Lesson 2.6

90 is what percent of 36?

A. 150% **B.** 250%

C. 40% **D.** 2.5%

WORK



FOE 7 OF 7

Clue Ticker

A clockwork detective who reads every clue: turning words into equations. Lesson 2.7. Battle it:
play.mathbound.org/alg1/?practice=r3.problem-solving-strategy

13 Lesson 2.7

A number decreased by 10 is 33. Find the number.

A. 43 **B.** 33

C. 10 **D.** 23

WORK

14 Lesson 2.7

10 more than the quotient of a number and 3 is 13. Find the number.

A. 1 **B.** 9

C. 69 **D.** 29

WORK

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Answer key · Chapter 2: Solving Linear Equations

Each answer is followed by its worked steps, as the game shows them after a battle.

Tip-Scale Tot

1. B: 2

1. Substitute each value in turn.
2. $4(2)+1=9$ and $3(2)+3=9$, so $x=2$.

2. A: -12

1. "-2 less than y" is $y-(-2)=y+2$.
2. $y+2=-10$, so $y=-12$.

Fraction Washer

3. B: 12

1. Subtract 6: $3=\frac{x}{4}$.
2. Multiply by 4: $x=12$.

4. B: -7

1. Subtract $0.5x$ from both sides: $-1x+0.5=7.5$.
2. $-1x=7$, so $x=-7$.

Side Sweeper

5. A: 10

1. Subtract x from both sides: $2x=20$.
2. $x=\frac{20}{2}=10$.

6. B: -4

1. The sentence is $-n=4n+20$.
2. Subtract $4n$: $-5n=20$.
3. $n=\frac{20}{-5}=-4$.

Mirror Twins

7. A: $x=-11$ or $x=-5$

1. Omar solved only $x+8=3$.
2. The bars also equal 3 when $x+8=-3$, so $x=-11$.
3. So $x=-11$ or $x=-5$.

8. A: $x=4$

1. $x-5=2x-7$ gives $x=2$; $x-5=-(2x-7)$ gives $x=4$.
2. Check: at $x=2$ the right side is -3, negative, and an absolute value cannot be. So $x=2$ is extraneous.
3. At $x=4$ both sides are 1: $x=4$.

Recipe Rover

9. A: 576

1. $V=12\cdot 8\cdot 6$.
2. $V=576$.

10. A: $C=\frac{5}{9}(F-32)$

1. Subtract 32: $F-32=\frac{9}{5}C$.
2. Multiply by $\frac{5}{9}$: $C=\frac{5}{9}(F-32)$.

Cash-Till Cassie

11. A: 30

1. "10% of them" means $0.1\cdot 300$.
2. 30 students ride the bus.

12. B: 250%

1. $\frac{90}{36}=2.5$.
2. That is 250%: more than 100%, since 90 is more than 36.

Clue Ticker

13. A: 43

1. Let n be the number: $n-10=33$.
2. Add 10: $n=33+10=43$.

14. B: 9

1. Let n be the number: $\frac{n}{3}+10=13$.
2. $\frac{n}{3}=3$, so $n=3\cdot 3=9$.

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