

Solution Manual for Prealgebra 5th Edition Lial Hestwood 0321845021 9780321845023

Full link download

Test Bank:

<https://testbankpack.com/p/test-bank-for-prealgebra-5th-edition-lial-hestwood-0321845021-9780321845023/>

Solution Manual:

<https://testbankpack.com/p/solution-manual-for-prealgebra-5th-edition-lial-hestwood-0321845021-9780321845023/>

CHAPTER 2 UNDERSTANDING VARIABLES AND SOLVING EQUATIONS

2.1 Introduction to Variables

2.1 Margin Exercises

The expression is .

The variable is . It represents the class limit. The constant is .

(a) Evaluate the expression when c is .

Replace c with 25.

Order books.

Evaluate the expression when c is .

Replace c with 60.

Order books.

(a) Evaluate the expression when s is feet.

Replace s with 3 feet.

• feet feet

The perimeter of the square table is feet.

Evaluate the expression when s is miles.

Replace s with 7 miles.

• miles miles

The perimeter of the square park is miles.

Evaluate the expression when a is .

— *Replace a with 40.*

— *Divide.*

Add.

The approximate systolic blood pressure is .

(a) Evaluate the expression when x is and

is

– *Replace with and with .*

(b)

Value of	Value of	Expression
		is
		is
		is
		is

(a) Multiplying any number by gives a product of .
 Any number times zero

Changing the grouping of addends , , does not change the sum.

7. (a) can be written as
is used as a factor times.
 can be written as
 can be written as
 can be written as

(a) means
 *Replace y with 5.*
 .. *Multiply left to right.*

(b) means
 . . . *Replace r with 6 and s with 3. . . . Multiply left to right.*

means
 . . . *Replace x with 4*
 . . . *and y with 3.*
 . . . *Multiply left to right.*

means
 . . . *Replace c with 2.*
 . . . *Multiply left to right.*
 . . .
 — *Divide.*

Your average score is .

44 Chapter 2 Understanding Variables and Solving Equations

2.1 Section Exercises

is the variable; is the
constant.

is the variable; is the
constant.

is the variable; is the constant.

is the variable; is the constant.

5. is the variable;
is the coefficient.

6. is the variable;
is the coefficient.

7. is the variable;
is the coefficient.
is the constant.

8. is the variable;
is the coefficient.
is the constant.

9. Both and are variables.

10. Both and are variables.

is the variable; is
the coefficient; is
the constant.

12. is the variable; is
the coefficient; is
the constant.

Expression (rule) for ordering robes:

Evaluate the expression when there are
graduates.

Replace g with 654.
Follow the rule and add.

robes must be ordered.

Evaluate the expression when there are
graduates.

Replace g with 208.
Follow the rule and add.

robes must be ordered.

Evaluate the expression when there are
graduates.

Replace g with 95.

Follow the rule and add.

robes must be ordered.

Expression (rule) for degrees:

isdegrees.

isdegrees.

isdegrees.

Expression (rule) for finding perimeter of
an equilateral triangle of side length :

Evaluate the expression when , the side
length, is inches.

Replace s with 11.

• *Follow the rule and multiply.*

inches is the perimeter.

Evaluate the expression when , the side
length, is feet.

Replace s with 3.

• *Follow the rule and multiply.*

feet is the perimeter.

Expression (rule) for perimeter:

•meters ismeters.

• inches isinches.

Expression (rule) for ordering brushes:

Evaluate the expression when , the class size,
is .

Replace c with 12.

• *Multiply before subtracting.*

brushes must be ordered.

Evaluate the expression when , the class size,
is .

Replace c with 16.

• *Multiply before subtracting.*

brushes must be ordered.

Expression (rule) for ordering doughnuts:

•isdoughnuts must be ordered.

•isdoughnuts must be ordered.

Expression (rule) for average test score, where is
the total points and is the number of tests:

Evaluate the expression when , the total
points, is and , the number of tests, is .

— *Replace p with 332 and t with 4.*

— *Follow the rule and divide.*

points is the average test score.

2.1 Introduction to Variables

Evaluate the expression when , the total points, is and , the number of tests, is .

— Replace p with 637 and t with 7.

— Follow the rule and divide.

points is the average test score.

Expression (rule) for buses:

is buses.

is buses.

21.

Value of	Expression	Expression
	is	\cdot is
	is	\cdot is
	is	\cdot is

22.

Value of	Expression	Expression
	is	is , or
	is	is , or
	is	is , or

23.

Value of	Value of	Expression
		is, or
		is, or
		is , or

24.

Value of	Value of	Expression
		$\cdot \cdot$ is
		$\cdot \cdot$ is
		$\cdot \cdot$ is

A variable is a letter that represents the part of a rule that varies or changes depending on the situation. An expression expresses, or tells, the rule for doing something. For example, is an expression, and is the variable.

The number part in a multiplication expression is the coefficient. For example, is the coefficient in .

A constant is a number that is added or subtracted in an expression. It does not vary. For example, is the constant in .

Multiplying a number by leaves the number unchanged. Let represent "a number."

\cdot or \cdot

28. Adding to any number leaves the number unchanged. Let represent "any number." or

Any number divided by is undefined. Let represent "any number."

— is undefined or is undefined.

\square \bar{A} \square \bar{A} \square
 Multiplication distributes over addition. Let , , and represent variables.

\cdot \cdot

written without exponents is

$\cdot \cdot \cdot \cdot \cdot$

written without exponents is

$\cdot \cdot \cdot \cdot \cdot$

written without exponents is

$\cdot \cdot \cdot \cdot \cdot$

written without exponents is

$\cdot \cdot \cdot \cdot \cdot$

can be written as $\cdot \cdot \cdot \cdot$. The exponent applies only to the base .

can be written as $\cdot \cdot \cdot$. The exponent applies only to the base .

can be written as $\cdot \cdot \cdot \cdot$. The exponent applies only to the base .

can be written as $\cdot \cdot \cdot \cdot \cdot$. The exponent applies only to the base .

can be written as $\cdot \cdot \cdot \cdot \cdot \cdot$. The exponent applies only to the base .

can be written as $\cdot \cdot \cdot \cdot$. The exponent applies only to the base .

can be written as $\cdot \cdot \cdot \cdot \cdot \cdot$. The exponent applies only to the base . The exponent applies only to the base .

can be written as $\cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot$. The exponent applies only to the base . The exponent applies only to the base .

Evaluate when is.

means

$\cdot \cdot$ *Multiply*
Replace t with 4.

58. Evaluate $\frac{4x + 2}{x - 2}$ when x is 4 and x is 2.
 Replace x with 4
 and y with 2.
 Follow the order of operations.
 Numerator:
 Denominator:

Undefined Division by 0 is undefined.

Relating Concepts (Exercises 59–60)

59. (a) Evaluate $\frac{1}{2}st$ when s is 20 and t is 15.
 Replace s with 15.
 Divide.
 miles

Evaluate $\frac{1}{2}st$ when s is 10 and t is 10.
 Replace s with 10.
 Divide.
 miles

Evaluate $\frac{1}{2}st$ when s is 5 and t is 5.
 Replace s with 5.
 Divide.
 mile

(a) Using part (c) of Exercise 59, the distance covered in seconds is half of the distance covered in seconds, or mile.

Using part (a) of Exercise 59, the time to cover miles is half the time to cover miles, or seconds. Or, using parts (b) and (c), find the number halfway between seconds and seconds

Using parts (a) and (b) of Exercise 59, find the number halfway between seconds and seconds; that is seconds.

2.2 Simplifying Expressions

2.2 Margin Exercises

(a)

The like terms are $3x$ and $2x$ since the variable parts match; both are x .
 The coefficients are 3 and 2.

The like terms are the constants, 5 and 10 .
 There are no variable parts.

The like terms are $3x$ and $2x$ since the variable parts match; both are x .

The coefficients are 3 and 2.

The like terms are $3x$ and $2x$ since the variable parts match; both are x .

The coefficients are 3 and 2.

2. (a) $3x + 2x$ These are like terms.

Add the coefficients.
 The variable part, x , stays the same.

(b) $3x^2 + 2x^2$ These are like terms.
 Rewrite y^3 as $1y^3$.
 Add the coefficients.

The variable part, y^3 , stays the same.

(c) $3n + 2n$ These are like terms.
 Rewrite n as $1n$.
 Change to addition.
 Add the coefficients.

The variable part, n , stays the same.

(d) $3c + 2c$ These are like terms.
 Change to addition.
 Add the coefficients.

The variable part, c , stays the same.

These are like terms.
 Rewrite xy as $1xy$
 Add the coefficients.

The variable part, xy , stays the same.

(f) $3p^2 + 2p^2$ These are like terms.
 Change to addition.
 Add the coefficients.
 The variable part, p^2 ,

These are like terms.
 Rewrite ab as $1ab$

stays the same.

*Change to addition.
Add the coefficients.*

Zero times anything is zero.

Copyright © 2014 Pearson Education, Inc.

3.(a)

Rewrite using the commutative property.
 Combine $3b^2 - 7b^2$
 Add the coefficients.

can be written as

$$\begin{array}{r} \cdot \quad \cdot \\ \cdot \end{array}$$

'A □

A A □

A □

(d)

A □

Rewrite x as $1x$.
 can be written as

A

Change to addition.
 Rewrite using the commutative property.

$$\begin{array}{r} \cdot \quad \cdot \\ \cdot \end{array}$$

Rewrite b as $1b$.
 Add the coefficients of like terms.

5.(a)

can be written as

$$\begin{array}{r} \cdot \cdot \\ \cdot \end{array}$$

(c)

Rewrite using the commutative property.
 Add the coefficients

(b) can be written as

of like terms.
 Zero times anything is zero.

(c) can be written as

$$\begin{array}{r} \cdot \cdot \\ \cdot \cdot \end{array}$$

(d)

Change to addition.
 Rewrite y as $1y$.
 Rewrite using the commutative prop.

(d)

Add the coefficients of like terms.

$$\begin{array}{r} \cdot \cdot \\ \cdot \cdot \end{array}$$

Multiply.
 Change addition to subtraction.

or

Change to addition.

Rewrite using the commutative prop.

(e)

$$\begin{array}{r} \cdot \cdot \\ \cdot \cdot \end{array}$$

Add the coefficients of like terms.

Multiply.
 Change addition to subtraction.

4.(a) means $\cdot \cdot \cdot$. Using the associative property, it can be rewritten as

$$\begin{array}{r} \cdot \cdot \\ \cdot \end{array}$$

6. (a)

Distributive property

$$\begin{array}{r} \cdot \cdot \\ \cdot \end{array}$$

Rewrite using the commutative property.
 Combine constants.

(b) can be

written as

(b)

Distributive property
 Multiply.

$$\begin{array}{r} \cdot \cdot \\ \cdot \end{array}$$

Combine constants.

(c) *Distributive property*
 .. *Multiply.*
Change to addition.
Rewrite using the commutative property.
Add the coefficients of like terms.

or

(d) *Distributive property*
 .. *Multiply.*
Change to addition.
Rewrite using the commutative property.
Combine constants.

(e)
Distributive property
Rewrite y as $1y$.
Change to addition.
Add the coefficients of like terms.
 o
 r

9. *These are like terms.*
Rewrite x^2 as $1x^2$.
Add the coefficients.
The variable part, x^2 , stays the same.

10. *These are like terms.*
Rewrite p as $1p$.
Change to addition. Add the coefficients.
The variable part, p , stays the same.

2.2 Section Exercises

1. $3x^2$ and $5x^2$ are the only like terms in the expression. The variable parts match; both are x^2 . The coefficients are 3 and 5.
2. $4x^2$ and $2x^2$ are like terms. The variable parts match; both are x^2 . The coefficients are 4 and 2.
3. $7x^2$ and $3x^2$ are the like terms in the expression. The variable parts match; both are x^2 . The coefficients are 7 and 3.
4. $2x^2$ and $5x^2$ are like terms. The variable parts match; both are x^2 . The coefficients are 2 and 5.
5. $3x^2$, $5x^2$, and $2x^2$ are like terms. There are no variable parts; constants are considered like terms.
6. 3 , 5 , and 2 are like terms. There are no variable parts; constants are considered like terms.

13.

These are like terms.

Rewrite a^3 as $1a^3$. Change to addition.

Any number minus itself is .

Add the coefficients.

The variable part, a^3 , stays the same.

Any number minus itself is .

*These are like terms.
Rewrite xy as $1xy$.
Change to addition.
Add the coefficients.*

or

*The variable part,
 xy , stays the same.*

*Use the commutative property
to put the constants at the end.*

*Add the coefficients of like terms.
The only like terms are constants.*

or

19.

*These are like terms.
Change to addition.
Add the coefficients.*

*The variable part, t^4 ,
stays the same.*

29.

*Write in the understood
coefficients of 1.
Add the coefficients of
like terms.*

*The variable part, ab^2 ,
stays the same.*

or

30.

21.

*These are like terms.
Write in the under-
stood coefficients*

*of 1.
Add the coefficients.
The variable part, y^2 ,
stays the same.*

31.

or

*Write in the understood
coefficients of 1.
Change to addition.
Rewrite using the
commutative property.
Add the coefficients of
like terms.*

*These are like
terms. Rewrite x as
 $1x$ and x as $1x$.
Change to addition.
Add the coefficients.*

*The variable part,
 x , stays the same.*

*Write in the under-
stood coefficient of 1.
Change to addition.
Rewrite using the
commutative property.*

Use the commutative property

*to rewrite the expression so that
like terms are next to each other.*

Add the coefficients of like terms.

*The variable part, a,
stays the same.*

*Add the coefficients of
like terms.*

35. There are no like terms.

The expression cannot be simplified.

36. There are no like terms. The expression cannot be simplified.

Write in the understood coefficients of 1. Change to addition.

Rewrite using the commutative property.

Add the coefficients of like terms.

or

By using the associative property, we can write as

So, simplifies to

By using the associative property, we can write as

So, simplifies to

By using the associative property, we can write as

By using the associative property, we can write as

So, simplifies to

By using the associative property, we can write as

So, simplifies to

Write in the understood coefficient of 1. Rewrite using the associative property.

Distributive property

Distributive property

Distributive property

So, simplifies to

Distributive property

••

••

Distributive property

••

*Change addition
to subtraction of
the opposite.*

69.

Distributive property

••

••

or

Rewrite using the commutative property. Add the coefficients of like terms.

Distributive property

••

Change addition to subtraction of the opposite.

Zero times any number is 0. Zero added to any number is the number

••

or

Distributive property

••

□

\bar{A} □

\bar{A} □

••

Distributive property

••

Rewrite using the commutative property.

Combine like terms.

□

\bar{A} □

\bar{A} □

istributive property

••

••

Change to addition.

Combine like terms. Any number plus its opposite is 0.

Distributive property

••

Combine like terms.

••

••

Distributive property

••

Change to addition.

Rewrite using the commutative property.

Add the coefficients of like terms.

Change addition to subtraction of the opposite.

••

73.

Distributive property

• *Rewrite n as 1n.*

Change to addition.

Rewrite using the commutative property. Add the coefficients of like terms.

or

or

••

Distributive property ..
 •
 • Rewrite p as $1p$.
 Change to addition.
 Add the coefficients of like terms. *Distributive property*

 Change addition to *Change to addition.*
 subt. of the opposite.
 .. *Group like terms and add the coefficients.*

or
 A simplified expression usually still has variables, but it is written in a simpler way. When evaluating an expression, the variables are all replaced by specific numbers and the final result is a numerical answer.

78.

• • • •
 The answers are equivalent because of the commutative property of addition. *Distributive property*
 Like terms have matching variable parts, that is, matching letters and exponents. The coefficients do not have to match. Examples will vary. .. • ..
 Possible examples: In $3x + 2y + 4x$, the terms $3x$ and $4x$ are like terms. In $3x + 2y + 4x + 5y$, the terms $3x$ and $4x$ are like terms.
Change to addition.

Group like terms and add the coefficients.

Add the coefficients of like terms. If no coefficient is shown, it is assumed to be 1. Keep the variable part the same. Examples will vary.

Keep the variable part unchanged when combining like terms. As shown above, the correct answer is $7x + 7y$.

In the last step, do not change the sign of the first term. The correct answer is $7x + 7y$.

83. *Distributive prop.* ...

Change subtraction to adding the opposite. Group like terms and add the coefficients.

Summary Exercises
Variables and Expressions

x is the variable; 1 or 1 is the coefficient; 5 is the constant.

2. $2x + 3y + 4x$ and $3y + 4x + 2x$ are the variables; 4 is the coefficient.

3. $3x + 2y + 4x + 5y$ is the variable; 3 is the coefficient; 5 is the constant.

54 Chapter 2 Understanding Variables and Solving Equations

Expression (rule) for finding the perimeter of an octagon of side length :

10. Replace with and with Evaluate the expression If is multiplied by any number, the result is Thus, there is no need to make any calculations since the result is

Follow the rule and multiply.

yards is the perimeter.

Evaluate the expression when , the side length, is inches.

Replace s with 15.

Follow the rule and multiply.

inches is the perimeter.

Expression (rule) for finding the total cost of a car with down payment , monthly payment , and number of payments :

Evaluate the expression when the down payment is \$, the monthly payment is \$, and the number of payments is .

Replace d with \$3000, m

with \$280, and t with 36.

\$ \$ • Multiply before adding.

\$ \$,

\$, is the total cost of the car.

Evaluate the expression when the down payment is \$, the monthly payment is \$, and the number of payments is .

Replace d with \$1750, m

with \$429, and t with 48.

\$ \$ • Multiply before adding.

\$ \$,

\$, is the total cost of the car.

written without exponents is

• • • •

written without exponents is

• • • •

written without exponents is

• • • • • • • •

9. • • • Replace with .

• • • Multiply left to right.

11. Replace with and with .

14. Replace with and with . If is multiplied by any number, the result is . Thus, there is no need to make any calculations since the result is .
.. Multiply left to right.

12: Replace with , with, and with

15. with. . . . Replace with and

. . . . Multiply left to right.

. . . .
. . . .
. . . .
. . . .

16. Replace with and with. Multiply left to right.

.
.
.

.
.

.
.
.

17. Use a calculator. Replace with , with , and with .

.
.
.

13. . . . Replace with.

.. Multiply left to right.

..

or

..

....

or

..

(a) Simplifying the expression correctly:

$$\cdot \quad \cdot$$

The student forgot to multiply \cdot .

Simplifying the expression correctly:

Two negative factors give a *positive* product.

Simplifying the expression correctly:

Keep the variable part unchanged; that is, adding 's to 's gives an answer with 's, not 's.

In the last step, do not change the sign of the first term; keep as . The correct answer is

2.3 Solving Equations Using Addition

2.3 Margin Exercises

28. \cdot \cdot
29. \cdot \cdot
30. \cdot \cdot
31. \cdot \cdot
32. \cdot \cdot
- or
- ..
- ..
- ..
- ..
- ..
1. (a) ? *Given equation*
 ? *Replace c with 95.*
110 is more than 80.
 No, is not the solution.
- (b) ? *Given equation*
 ? *Replace c with 28.*
 No, is not the solution.
 ? *Replace c with 20.*
 No, is not the solution.
 ? *Replace c with 24.*
 No, is not the solution.
 ? *Replace c with 32.*
 Balances
- Yes, is the solution.

56 Chapter 2 Understanding Variables and Solving Equations

(a) Solve for r .

Combine like terms.

To get r by itself, add the opposite of -1 , which is 1 . To keep the balance, add 1 to *both* sides.

To get r by itself, add 1 to both sides.

or The solution is $r = 2$.

Check

The solution is $r = 2$.

•• *Replace r with 2 .*

Check

Original equation

Replace y with 7 .

Balances, so solution is $r = 2$.

Solve for r .

Balances

Change to addition.

To get by itself add the opposite of , which is , to both sides.

To get by itself add the opposite of , which is , to both sides.

()

The solution is.

Check

Original equation
Replace k with 4.

()()

Balances

(b)
addition.

Change to

Rewrite the left side by using the commutative property.

The solution is.

Check

Original equation
Replace b with 4.

Balances

3. **(a)** Rewrite both sides by changing subtraction to addition. Combine like terms.

2.3 Section Exercises

1. Replace with , , , and .

Given equation

? *Replace n with 58.*

?

Yes, is the solution.

(No need to check , , and .)

2. Replace with , , , and .

? ?

? ?

? ?

? ?

The check for balances, so is the solution.

3. Replace with, , , and.

Given equation

? *Replace y with 4.*

No, is not the solution.

?

Replace y with 16.

Yes, is the solution.

(No need to check and.)

4. Replace with, , , and.

? ?

?

is the solution. (No need to check .)

5. (a) Add to both sides because giveson the left side. $\underline{\hspace{1cm}}$ Add 8 to both sides.
 (b) Addto both sides becausegiveson the right side. The solution is.

6. (a) Addto both sides becausegiveson the left side. **Check** *Replace a with 9.*

(b) Add to both sides because giveson the right side. **Balances** **13.**

7. *Add the opposite of 5, 5, to both sides.* $\underline{\hspace{1cm}}$ $\underline{\hspace{1cm}}$ *Add the opposite of 4, 4, to both sides.* $\underline{\hspace{1cm}}$ $\underline{\hspace{1cm}}$

$\underline{\hspace{1cm}}$ $\underline{\hspace{1cm}}$ The solution is . The solution is .

Check *Replace p with 4.* **Check** *Replace k with 18.*
 Balances Balances

$\underline{\hspace{1cm}}$ $\underline{\hspace{1cm}}$ *Add 3 to both sides.* *Add 9 to both sides.*
 The solution is . The solution is .

Check *Replace a with 9.* **Balances** *Replace y with 16.*
 Balances

Change to addition. $\underline{\hspace{1cm}}$ $\underline{\hspace{1cm}}$ *Change to addition. Add the opposite of 6, 6, to both sides.*
Add the opposite of 2, 2, to both sides. $\underline{\hspace{1cm}}$ $\underline{\hspace{1cm}}$
 The solution is .

$\underline{\hspace{1cm}}$ $\underline{\hspace{1cm}}$ The solution is . **Check** *Replace y with 6.*
Check *Replace r with 10.* **Balances**
 Balances **16.**

Change to addition. $\underline{\hspace{1cm}}$ $\underline{\hspace{1cm}}$ *Change to addition. Add 15 to both sides.*
 $\underline{\hspace{1cm}}$ $\underline{\hspace{1cm}}$ *Add 5 to both sides.* $\underline{\hspace{1cm}}$ $\underline{\hspace{1cm}}$
 The solution is .

$\underline{\hspace{1cm}}$ $\underline{\hspace{1cm}}$ The solution is . **Check** *Replace k with 15.*
Check *Replace b with 8.* **Balances**
 Balances

11. *Add the opposite of 3, 3, to both sides.* $\underline{\hspace{1cm}}$ $\underline{\hspace{1cm}}$ *Add the opposite of 13, 13, to both sides.* $\underline{\hspace{1cm}}$ $\underline{\hspace{1cm}}$
 The solution is. The solution is.

Check *Replace n with 8.* **Check** *Replace r with 6.*

Balances

Balances

Copyright © 2014 Pearson Education, Inc.

58 Chapter 2 Understanding Variables and Solving Equations

Correct solution:

_____ Add 19 to both sides.

The solution is.

Check

Replace z with 7.

Balances

Change to addition.

Add the opposite of 5, 5, to both sides.

The solution is .

Check

Replace z with 8.

Change to addition.

Balances

19.

Change to addition.

Add the opposite of

12, 12, to both sides.

The solution is .

Check

Replace x with 0.

Change to addition.

Balances

24.

The given solution is .

Check

Replace x with 13.

Balances

is the correct solution.

Change to addition.

Add 3 to both sides.

The solution is .

25.

The given solution is .

Check

Replace x with 18.

Balances

is the correct solution.

Check

Replace m with 0.

Balances

26.

The given solution is .

Check

Replace k with 5.

Does not balance

Correct solution:

Add the opposite of

2, 2, to both sides.

The correct solution is.

Check

Replace k with 9.

Balances

21.

Add the opposite of

2, 2, to both sides.

The solution is.

Check

Replace t with 3.

Balances

22.

Add 10 to both sides.

The solution is .

Check

Replace w with 9.

Balances

27.

The given solution is .

Check

Replace b with 10.

Does not balance

23.

The given solution is .

Correct solution:

Does not balance

Check

Replace z with 2.

Change to addition.

*Add the opposite of
10, 10, to both sides.*

The solution is .

Copyright © 2014 Pearson Education, Inc.

Check

Replace b with 0.
Balances Add 4 to both sides.

28.

Th

The solution is .

Check

e given solution is .

Check

Replace a with 0.
Does not balance

Balances

Change to addition.

Add.
Add 10.

Correct solution:

The solution is.

Check

Add the opposite of 14, 14, to both sides.

The correct solution is .
Replace a with 14.

Balances

Replace b with 30.

Balances

Simplify the right side.
Change to addition.
Add 4 to both sides.

Add 1 to both sides.

The solution is .

The solution is.

Check

Replace c with 6.
Balances

Check

Replace w with 17.

Balances

30.

35.

Change to addition.

Simplify the right side.
Add 2 to both sides.

The solution is .

The solution is .

Check

Replace b with 12.
Balances

Check

Replace t with 0.
Change to addition.
Balances

31.

Simplify the left side.
Change to addition.
Add 2 to both sides.

36.

Add 8 to both sides.

Check

The solution is .

The solution is .

Replace y with 5.
Change to addition.
Balances

Check

Replace p with 0.

Balances

60 Chapter 2 Understanding Variables and Solving Equations

1x is the same as x.

The solution is.

Change to addition.

Combine like terms.

*1z is
the
same as
z. The
solution
is .*

Check

••Replace z with 7.

*Change to add.
Balances*

38.

The solution is.

Check

*•
Replace r with 5.
Balances
Rearrange and
combine like terms.*

39.

_____ Add 2 to both sides.

_____ The solution is .

Check

•• Replace w with 3.

Balances

*_____ Add 4 to
both sides. _____*

The solution is.

Check

Let t = 5.

Balances

41.

*Change to addition.
Combine like terms.*

_____ Add 4 to both sides. _____

Add 75 to both sides.

The solution is. *Add 2.*

Change to addition.

Add 200 to both sides.

 The solution is.

43.

The solution is 1 .

Change to addition.

Combine like terms.

Rearrange and

The solution is .

47. *combine like terms.*

44.

 Add 3 to both sides.

Change to addition.

Combine like terms.

The solution is .

The solution is .

C

h

a

n

Add 4 to both sides.

g

e

The solution is .

t

 Add 31 to both sides.

a

The solution is.

d

50.

d

 Add 72 to both sides.

t

i

The solution is.

o

n

.

The solution is .

Change to addition.
~~()~~ *Change to addition.*

$$\underline{\hspace{2cm}} \quad \underline{\hspace{2cm}}$$

*Rearrange and
 Combine like terms.
 combine like terms.
 Add 6 to both sides.
 Add 9 to both sides.*

The solution is .
 The solution is .

Change to addition.

$$\underline{\hspace{2cm}} \quad \underline{\hspace{2cm}}$$

*Combine like terms.
 Add 5 to both sides.*

The solution is.

$$\underline{\hspace{2cm}} \quad \underline{\hspace{2cm}} \quad \text{Add } 91 \text{ to both sides.}$$

The solution is.

Change to addition.

$$\underline{\hspace{2cm}} \quad \underline{\hspace{2cm}} \quad \text{Add } 28 \text{ to both sides.}$$

The solution is .

Combine like terms.

$$\underline{\hspace{2cm}} \quad \underline{\hspace{2cm}} \quad \text{Add } 5 \text{ to both sides.}$$

The solution is.

58.

$$\underline{\hspace{2cm}} \quad \underline{\hspace{2cm}} \quad \text{Add } 6 \text{ to both sides.}$$

The solution is.

No, the solution is , the number used to replace in the original equation.

n, add to both sides, not .
The correct solution is .

61. h
e
c ¹⁰ ¹⁰ Add the opposite of
k _____ 10, 10, to both sides.

D
o
e
s

n
o
t

b
a
l
a
n
c
e

T
o

c
o
r
r
e
c
t

t
h
e

e
r
r
o
r
s
,

c
h
a
n
g
e

There were graduates this year.

62. .

T ¹⁰ ¹⁰ Add the opposite of
h _____ 10, 10, to both sides.
e

st year.

_____ *Add 37 to both sides.*

When the temperature is degrees, a field cricket chirps times (in seconds).

_____ *Add 37 to both sides.*

When the temperature is degrees, a field cricket chirps times (in seconds).

Change to addition.
_____ *Add 65 to both sides.*

l
a

s average \$ per month in winter.

66.

Change to addition.

_____ *Add 56 to both sides.*

E

r

n

e

s

Aimee's parking fees average \$ per month in winter.

,

s

p

a

r

k

i

n

g

f

e

e

62 Chapter 2 Understanding Variables and Solving Equations

*Change all subtractions to additions.
Commutative property
Combine like terms.*

Add 11 to both sides.

The solution is _____ .

The solution is _____ .

69.

Change subtraction within absolute value to addition and rearrange the terms.

Add the opposite of 10, -10, to both sides.

The solution is _____ .

Equations will vary. Some possibilities are:

Add the opposite of 6, -6, to both sides.

The solution is _____ .

Add the opposite of 5, -5, to both sides.

72. (a)

The solution is _____ .

Add the opposite of 1, -1, to both sides.

The solution is _____ .

Simplify inside absolute value bars. Collect like terms.

Evaluate absolute values.
Change to addition.

_____ Add 6 to both sides.

The solution is .

The solution is .

Change to addition.

Add the opposite of 1, 1, to both sides.

_____ or _____ The solution is _ .

(c) \$ \$

\$ \$

Add the opposite of \$2.50, \$2.50, to both sides.

\$ \$
\$ \$
\$ \$

The solution is \$.

Equations will vary. Some possibilities are:

\$ \$ The solution is \$.

\$ \$ The solution is \$.

2.4 Solving Equations Using Division

2.4 Margin Exercises

- (a) Solve.

Use division to undo multiplication. Divide *both* sides by the coefficient of the variable, which is .

The solution is .

Relating Concepts (Exercises 71–72)

- (a) Equations will vary. Some possibilities are:

Change to addition.

_____ Add 1 to both sides.

The solution is.

Check *Original equation*
 $\frac{\underline{\quad}}{\underline{\quad}}$ • Replace s with 11 .
 Balance

Replace p with 1 .

Balances

$\frac{\underline{\quad}}{\underline{\quad}}$ *Divide both sides by 9.*

The solution is .

Check • *Replace p with 3.*
 Balances

$\frac{\underline{\quad}}{\underline{\quad}}$ *Divide both sides by 5.*

The solution is .

Check • *Replace x with 8.*
 Balances

$\frac{\underline{\quad}}{\underline{\quad}}$ *Divide both sides by 7.*

The solution is.

Check • *Replace t with 10.*
 Balances

(a) $\frac{\underline{\quad}}{\underline{\quad}}$ *Combine like terms.*
Divide both sides by 4.
 The solution is.

Check • *Replace n with 7.*
 Balances

Change to addition. Rewrite p as $1p$.

$\frac{\underline{\quad}}{\underline{\quad}}$ *Combine like terms.*

(a)

Write in the understood 1 as the coefficient of k .
Divide both sides by 1.
 The solution is .

Check

• *Replace k with 12.*
 Balances

$\frac{\underline{\quad}}{\underline{\quad}}$ *Write t as $1t$.*
Divide both sides by 1.
 The solution is .

Check

• *Replace t with 7.*
 Balances

$\frac{\underline{\quad}}{\underline{\quad}}$ *Write m as $1m$.*
Divide both sides by 1.
 The solution is .

Check

• *Replace m with 20.*
 Balances

2.4 Section Exercises

$\frac{\underline{\quad}}{\underline{\quad}}$ *Divide both sides by 6.*
 The solution is .

Check

$\frac{\underline{\quad}}{\underline{\quad}}$ • *Replace z with 2.*
 Balances
Divide both sides by 13.

$\frac{\underline{\quad}}{\underline{\quad}}$

2.

Check

B
al
a
n
c
e
s

.

—

— —

The solution is .

The solution is.

Copyright © 2014 Pearson Education, Inc.

— — *Divide both sides by 12.*
The solution is .

Check .

Replace r with 4.
Balances

Check .

— —

Balances

The solution is .

— — *Divide both sides by 3.*
The solution is .

Check
• *Replace y with 0.*
Balances

6. Check .

— —

Balances

The solution is .

— — *Divide both sides by 7.*
The solution is .

Check

• *Replace k with 10.*
Balances

8. Check .

— —

Balances

The solution is .

— — *Divide both sides by 9.*
The solution is .

Check

• *Replace r with 6.*
Balances

10. Check .

— —

— — *Divide both sides by 5.*
The solution is .

Check

• *Replace b with 5.*
Balances

12. Check .

— —

Balances

The solution is .

— — *Combine like terms.*
Divide both sides by 2.
The solution is .

Check

• *Replace r with 3.*
Balances

Check .

— —

Balances

The solution is .

Change to addition. Rewrite p as 1p. Combine like terms.
Divide both sides by 4.
The solution is .

Check

• *Replace p with 3.*

Change to addition.
Balances

Balances

65 Chapter 2 . Understanding Variables and Solving Equations *Change to addition.*
Combine like terms.
Divide both
sides by 10.
The solution is .

Check

• $z = 2$
 Change to addition.
 Balances

Original equation
 Change to addition.
 Combine like terms.
 Divide both sides by 12.
 The solution is .

Original equation
 Change to addition.
 Combine like terms.
 Divide both sides by 5.
 The solution is .

Original equation
 Divide both sides by 9.
 The solution is .

Original equation
 Combine like terms.
 Divide both sides by 8.
 The solution is .

Original equation
 Divide both sides by 10.
 The solution is .

27.

Original equation
 Change to addition.

Original equation
 Change to addition.
 Rewrite x as $1x$.
 Combine like terms.
 Divide both sides by 8.
 The solution is .

28.

Combine like terms.
 Divide both sides by 6.
 The solution is .

Original equation
 Change to addition.
 Rewrite c as $1c$.
 Combine like terms.
 Divide both sides by 3.
 The solution is .

Combine. Divide both sides by 7.
 The solution is .

Original equation
 Change to addition.
 Combine like terms.
 Divide both sides by 4.
 The solution is .

21.

Original equation
 Change to addition.
 Rewrite w as $1w$.
 Combine like terms.

Original equation
 Change to addition.
 Combine like terms.
 Divide both sides by 11.
 The solution is .

22.

Original equation
 Change to addition.
 Combine like terms.
 It is the same as t .
 The solution is .

31.

Original equation
 To multiply on the left, use the associative property.

Original equation
 Change to addition.
 Combine like terms.
 Divide both sides by 12.
 The solution is .

Divide both sides by 6.
 The solution is .

•• Original equation
To multiply on the left, use
the associative property.

Divide both

— — sides by 8.
The solution is .

•• Original equation
To multiply on the right,
use the associative prop.

Divide both
sides by 25.
The solution is .

— — Original equation
•• To multiply on the right,
use the associative prop.

— — Divide both
sides by 12.
The solution is .

• • Original equation
Associative property

— — Divide both
sides by 8.
The solution is .

• • Original equation
Associative property

— — Divide both
sides by 20.
The solution is .

37. •• Original equation
Associative property

— — Divide both
sides by 30.
The solution is.

38. •• Original equation
Associative property

— — Divide both
sides by 10.
The solution is.

39. Original equation
Write in the understood 1.

— — Divide both
sides by 1.

Original equation
Write in the understood 1.
Divide both
sides by 1.
The solution is .

41. Original equation
Write in the understood 1.
Divide both
sides by 1.
The solution is .

— — Original equation
Write in the understood 1.
Divide both
sides by 1.
The solution is .

— — Original equation
Write in the understood 1.
Divide both
sides by 1.
The solution is .

— — Original equation
Write in the understood 1.
Divide both
sides by 1.
The solution is .

— — Original equation
Write in the understood 1.
Divide both
sides by 1.
The solution is .

Original equation
Write in the understood 1.

— — Divide both
sides by 1.
The solution is.

Each solution is the opposite of the number in the equation. So the rule is: When you change the sign of the variable from negative to positive, then change the number in the equation to its opposite. In , the opposite of is , so .

Equations will vary. Some possibilities are (i) and (ii).

— — Divide both
sides by 5.

Change to addition. \dots
 Combine like terms. *Associative property*
 Divide both sides by 2. $\text{---} \text{---}$
 The solution is \dots *Change to addition.*
 Combine like terms. *Divide both*
 Divide by the coefficient of \dots , which is \dots , not by the opposite of \dots .
 $\text{---} \text{---}$ *sides by 50.*

The solution is \dots .
 \dots
 $\text{---} \text{---}$
 The correct solution is \dots *Assoc. prop. Simplify within the absolute values.*

You can divide both sides of an equation by the same nonzero number and keep the equation balanced.
Simplify the absolute values. Combine like terms.
Divide both
 $\text{---} \text{---}$ *sides by 70.*

The solution is \dots .
 $\text{---} \text{---}$ *Divide both sides by 3.*

The length of one side is \dots feet.
52. **58.**
 $\text{---} \text{---}$ *Divide both sides by 3.* *Simplify within the absolute value.*

The length of one side is \dots inches.
Simplify the absolute value.
Combine like terms.
 $\text{---} \text{---}$ *Divide both sides by 5.* $\text{---} \text{---}$ *Divide both sides by 10.*

The length of one side is \dots meters. The solution is \dots .

2.5 Solving Equations with Several Steps

2.5 Margin Exercises

$\text{---} \text{---}$ *Divide both sides by 5.*
 The length of one side is \dots yards. **1.(a)** $\text{---} \text{---}$ $\text{---} \text{---}$ *To get $2r$ by itself, divide both sides by 7 to both sides.*

\dots
Associative property
Change to addition.
Combine like terms.
Divide both
Check
To solve for r , divide both sides by the coefficient, 2.
 The solution is \dots .

— —

sides by 1.

•Replace r with 3.

The solution is .

Balances

Copyright © 2014 Pearson Education, Inc.

*Change to addition.
Add 9 to both sides.*

*Divide both
sides by 10.
The solution is .*

Rewrite p as $1p$.
Add $3p$.

Check

• Replace r with 2 .

Balances

(a) Solve, keeping the variable on *left* side.

_____ Add $2y$ to both sides.

_____ Change to addition.
Add 1 to both sides.

or The solution is .

Solve , keeping the variable on the *right* side.

_____ Add $3y$ to both sides.

_____ Add 7 to both sides.

_____ Divide both
sides by 1 .
The solution is .

Solve, keeping the variable on *left* side.

Rewrite p as $1p$.

_____ Add $1p$ to both sides.

Change to addition.

Add 2 to both sides.

_____ Divide both
sides by 2 .
The solution is .

Solve , keeping the variable on the *right* side.

Add 6 .

_____ Divide both
sides by 2 .

The solution is .

(a)

• • Distribute on the *right*.

_____ Change to addition.
Add 4 to both sides.

_____ Divide both
sides by 4 .
The solution is .

Check

Replace y with 2 .

Balances

(b) .. Distribute on the *left*.

_____ Add 20 to both sides.

_____ Divide both
sides by 5 .
The solution is .

Check

Replace m with 0 .

Balances

• • Distribute on the *left*.

_____ Change to addition.
Add 12 to both sides.

_____ Divide both
sides by 6 .
The solution is .

Check

Replace t with 5.

Check

Let p = 1.

4.(a)

Balances

— — Balances

Distribute. 2.

Check

..

Variables left

Add 2b.

Balances

Add 21.

The solution is .

or

The solution is.

Check

Change to addition.

Add 6 to both sides.

.

Balances

(b) *Distribute*

..

like terms.

— —

Add the
opposite.
Combine

Add 2n.

Add 6.

— —

Divide both
sides by 6.

The solution is .

Check

.

Let $n = 2$.

Balances

2.5 Section Exercises

To get $7p$ by itself,
add 5 to both sides.

— —

Divide both
sides by 7.

The solution is .

Divide both
sides by 8.

The solution is .

Check

Replace y with 1.

Balances

Check

4.

— _____

— —

Balances

The solution is .

5.

To get $9a$ by itself,
add 10 to both sides.

— —

Divide both
sides by 9.

The solution is .

Check

Replace a with 2.

Balances

6.

Check

— —

Balances

The solution is .

70 Chapter 2 Understanding Variables and Solving Equations

7. To get $3m$ by itself,
add 1 to both sides.

Solve , keeping the variable on the *left* side.

_____ Divide both
sides by 3.
The solution is .

Check

Replace m with 0.

Balances

The solution is .

Check

Balances

9. _____ Change to addition.
To get $5x$ by itself,
add 4 to both sides.

_____ Divide both
sides by 5.
The solution is .

Check

Replace x with 4.
Balances

10.

The solution is .

Change to addition.
Add $4p$ to both sides.

Add 2 to both sides.

Divide both
sides by 2.
The solution is .

Solve , keeping the variable on the *right* side.

Change to addition.
Add $6p$ to both sides.

Add 6 to both sides.

Divide both
sides by 2.
The solution is .

Check

Balances

12. Left side:

Right side:

The solution is .

Balances

Balances

Copyright © 2014 Pearson Education, Inc.

Solve , keeping the variable on the *left* side.

_____ _____
Change to addition.
Add 6k to
both sides.

_____ _____
Add 6 to
both sides.

_____ _____
Divide both
sides by 8.
 The solution is _____ .

Solve , keeping the variable on the *right* side.

_____ _____
Change to addition.
Add 2k to
both sides.

_____ _____
 _____ _____
 _____ _____

Check

simplifies to _____ .

_____ _____
Add 2a to
both sides.

_____ _____
Add 18 to
both sides.

_____ _____
Divide both
sides by 5.

The solution is _____ .

Check

Balances

16.

Add 10 to
both sides.
Divide both
sides by 8.
 The solution is _____ .

simplifies to _____ .

Replace k with 2.

Balances

The solution is.

Add 10 to both sides.

Divide both sides by 5.

14. Left side:

Right side:

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Balances

Neither side can be simplified, so solve the equation.

The solution is .

Check

Add 3t to both sides.

Divide both sides by 11.

The solution is .

Check

Replace t with 0.

Balances

Balances

Neither side can be simplified, so solve the equation.

_____ $+$ _____ $=$ _____
Add 9z to both sides.

_____ $=$ _____
Divide both sides by 24.
The solution is _____.

Check

Replace z with 0.
Balances

simplifies to _____.

_____ $+$ _____ $=$ _____
Add 2 to both sides.

_____ $=$ _____
Divide both sides by 2.

The solution is _____.

Check

Balances

simplifies to _____.

_____ $+$ _____ $=$ _____
Add 2z to both sides.

_____ $=$ _____
Add 12 to both sides.

_____ $=$ _____
Divide both sides by 7.

The solution is _____.

Check

21.

_____ $+$ _____ $=$ _____
Distribute.
Change to addition.
Add 16 to both sides.

_____ $=$ _____
Divide both sides by 8.
The solution is _____.

22.

_____ $+$ _____ $=$ _____
Distribute.
Change to addition.
Add 36 to both sides.

_____ $=$ _____
Divide both sides by 9.
The solution is _____.

23.

_____ $+$ _____ $=$ _____
Distribute.
Add 8 to both sides.

_____ $=$ _____
Divide both sides by 2.
The solution is _____.

24.

_____ $+$ _____ $=$ _____
Distribute.
Add 18 to both sides.

_____ $=$ _____
Divide both sides by 3.
The solution is _____.

25.

_____ $+$ _____ $=$ _____
Distribute.
Add 8 to both sides.

_____ $=$ _____
Divide both sides by 4.
The solution is _____.

26.

_____ $+$ _____ $=$ _____
Distribute.
Add 15 to both sides.

Balances

— Divide both
sides by 5.
The solution is.

27.

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Distribute.
Change to addition.
Add 30 to both sides.

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Divide both sides by 6.
 The solution is .

28.

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Distribute.
Change to addition.
Add 49 to both sides.

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Divide both sides by 7.
 The solution is .

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Distribute.
Change to addition.
Add 24 to both sides.

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Divide both sides by 12.
 The solution is .

30.

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Distribute.
Change to addition.
Add 33 to both sides.

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Divide both sides by 11.
 The solution is .

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Distribute.
Change to addition.
Add 4 to both sides.

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Divide both sides by 2.
 The solution is .

32.

Distribute.

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Divide both sides by 9.
 The solution is.

33.

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Add 18 to both sides.

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Divide both sides by 6.
 The solution is.

34.

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Change to addition.
Add 40 to both sides.

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Divide both sides by 8.
 The solution is .

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Change to addition.
Add 12 to both sides.

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

C
h
a
n
g

3

6.

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

e
t
o
a
d
d

37.

$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

i
t
i
o
n

Add 9 to both sides.

38

Combine like terms.

_____ Add $2k$.

_____ _____ Add 5.

_____ *Divide by 2.*

The solution is _____.

The solution is _____.

Change to add.

*Combine terms.
Add 6.*

Divide both sides by 1.

The solution is _____.

Change to add.

*Combine terms.
Add 5.*

Divide both sides by 1.

The solution is _____.

51.

*Distribute.
Change to add.*

Add 6c.

Add 42.

_____ *Add 3x.*

Add 8.

*Divide both sides by 7.
The solution is.*

_____ *Add 6p.*

_____ *Add 17.*

_____ *Divide by 16.*

The solution is _____.

The solution is _____.

_____ *Add 4.*

_____ *Add b.*

The solution is .

The solution is .

$$\begin{array}{r} \underline{\hspace{2cm}} \\ \underline{\hspace{2cm}} \\ \hline \end{array} \quad \begin{array}{r} \underline{\hspace{2cm}} \\ \underline{\hspace{2cm}} \\ \hline \end{array} \quad \text{Add } 1.$$

The solution is .

The series of steps may vary. One possibility is:
Change to addition.
Add 2t to both sides

$$\begin{array}{r} \underline{\hspace{2cm}} \\ \underline{\hspace{2cm}} \\ \hline \end{array} \quad \begin{array}{r} \underline{\hspace{2cm}} \\ \underline{\hspace{2cm}} \\ \hline \end{array} \quad \begin{array}{l} \text{(addition property).} \\ \text{Add } 5 \text{ to both sides} \\ \text{(addition property).} \\ \text{Divide both sides by } 5 \\ \text{(division property).} \end{array}$$

The solution is .

Multiplication distributes over both addition and subtraction. Examples will vary. Some possibilities are $3(x + 2)$ and $3(x - 2)$ is.

Check

The check does not balance, so is not the correct solution. The student added to on the left side, instead of adding to . The correct solution, obtained using , , is .

Check

The check does not balance, so is not the correct solution.

$$\begin{array}{r} \underline{\hspace{2cm}} \\ \underline{\hspace{2cm}} \\ \hline \end{array} \quad \begin{array}{r} \underline{\hspace{2cm}} \\ \underline{\hspace{2cm}} \\ \hline \end{array} \quad \begin{array}{l} \text{Student did not} \\ \text{distribute the} \\ \text{over the .} \end{array}$$

The sum of and a positive number is negative, so must be negative.

- (a) It must be positive, because the sum of two negative numbers is always negative.

The sum of and a negative number is positive, so must be positive.

- (a) It must be positive. When the signs are the same, the product is positive, and when the signs are different, the product is negative.

The product of and a negative number is negative, so must be positive.

- (a) It must be negative also. When the signs are

different, the product is negative, and when the signs match, the product is positive.

The product of and a negative number is positive, so must be negative.

Chapter 2 Review Exercises

- (a) In the expression , is the variable, is the coefficient, and is the constant term.

The term that has as the constant term and as the coefficient is .

- (a) Evaluate when is .

• *Replace c with 15.*

Order test tubes.

Evaluate when is .

• *Replace c with 24.*

Order test tubes.

- (a) means

means

- (a) means

• *Replace n with 3.*

means

The correct solution is

$$\begin{aligned} & \cdot \cdot \\ & \cdot \cdot \cdot \quad \text{Replace } n \text{ with } 3. \\ & \cdot \end{aligned}$$

Relating Concepts (Exercises 61–64)

(a) It must be negative, because the sum of two positive numbers is always positive.

(c) means

.. .

Replace m with 2
and p with 4.

.. . . .

.

(d) means

..... .

Replace m with 2
and n with 3.

.

.

. . . .

. . .

..

.

Combine like terms.

or

6.

Rewrite x as $1x$.
Change to addition.
Combine like terms.

Associative property

.

Associative property

..

.

9. Distribute.

..

10.

Distribute.

..

or

11.

Distribute.

..

12. Distribute.

or

Expressions will vary. One possibility is

.

The solution is.

Check

Replace n with
Balances

11.

15.

The solution is .

Check _____

Balances

Divide both
sides by 6.
The solution is.

Combine like terms.
Divide both
sides by 4.
The solution is .

_____ Divide both
sides by 7.
The solution is .

19.

Divide both
sides by 3.
The solution is.

78 Chapter 2 Understanding Variables and Solving Equations

— — Divide both sides by 15.
The solution is .

— — Divide both sides by 3.
The solution is.
[2.5]
Distribute.

— Divide both sides by 1.
The solution is .

Add 8w to both sides.

$\frac{\underline{\hspace{1cm}}}{\underline{\hspace{1cm}}}$

Divide both sides by 2.
 Add 6 to both sides.
 The solution is $\underline{\hspace{1cm}}$.

$\underline{\hspace{1cm}} - \underline{\hspace{1cm}}$

Add 6y to both sides.

$\underline{\hspace{1cm}} - \underline{\hspace{1cm}}$

Add 4 to both sides.

$\underline{\hspace{1cm}} - \underline{\hspace{1cm}}$

Divide both sides by 4.
 The solution is $\underline{\hspace{1cm}}$.

28. [2.5]

$\underline{\hspace{1cm}} - \underline{\hspace{1cm}}$

Divide both sides by 4.

*Add the opposites.
 Combine like terms.
 Divide both sides by 5.*

The solution is $\underline{\hspace{1cm}}$.

23.

•• Distribute.

The solution is $\underline{\hspace{1cm}}$.

29. [2.5]

$\underline{\hspace{1cm}} - \underline{\hspace{1cm}} - \underline{\hspace{1cm}}$

Add 8 to both sides.

$\underline{\hspace{1cm}} - \underline{\hspace{1cm}}$

Add 7 to both sides.

$\underline{\hspace{1cm}} - \underline{\hspace{1cm}}$

Divide both sides by 4.
 The solution is $\underline{\hspace{1cm}}$.

$\underline{\hspace{1cm}} - \underline{\hspace{1cm}}$

Divide both sides by 3.
 The solution is $\underline{\hspace{1cm}}$.

30. [2.5]

24.

$\underline{\hspace{1cm}} - \underline{\hspace{1cm}}$

Add 4 to both sides.

$\underline{\hspace{1cm}} - \underline{\hspace{1cm}}$

Add 3b to both sides.

$\underline{\hspace{1cm}} - \underline{\hspace{1cm}}$

Divide both sides by 2.

$\underline{\hspace{1cm}} - \underline{\hspace{1cm}}$

Add 6 to both sides.

The number of employees is $\underline{\hspace{1cm}}$.

25. [2.5]

$\underline{\hspace{1cm}} - \underline{\hspace{1cm}}$

Add 4a to both sides.

31. [2.3]

$\underline{\hspace{1cm}} - \underline{\hspace{1cm}}$

Divide both sides by 2.
 The solution is $\underline{\hspace{1cm}}$.

$\underline{\hspace{1cm}} - \underline{\hspace{1cm}}$

$\underline{\hspace{1cm}} - \underline{\hspace{1cm}}$

Add 3 to both sides.

The solution is $\underline{\hspace{1cm}}$.

Chapter 2 Test

[2.5]

_____ *Distribute.*
 _____ *Add 3n to both sides.*

_____ *Add 3 to both sides.*

— *Divide both sides by 3.*
 The solution is .

[2.5]

Distribute.
 _____ *Add 42 to both sides.*

— *Divide both sides by 21. The solution is .*

[2.5]

_____ *Add 6d.*

_____ *Add 13 to both sides.*

— *Divide by 4.*

The solution is .

35. [2.5]

_____ *Add 12b to both sides.*

— *Divide by 18.*

The solution is.

In the expression, is the coefficient, is the variable, and is the constant term.

Evaluate the expression when is and is .

. .

Buy hot dogs.

3. means

4. means

5. means

. . .

. ..

. .

.

Replace s with 5 and t with 4.

7.

8.

or

9.

There are no like terms. The expression cannot be simplified.

10.

.. *Associative property of multiplication*

80 Chapter 2 Understanding Variables and Solving Equations

The solution is \cdot *Associative property*
 \cdot *of multiplication*

Distributive property

\cdot \cdot *Distributive property*

14.

Distributive property

Combine like terms.

or

*Combine
like terms.*

16.

 Add 9 to both sides.

$$\frac{\quad}{\quad} \quad \frac{\quad}{\quad} \quad \text{sides by } 3.$$

The solution is .

Check

$$6 \quad \text{Replace } a \text{ with } 3.$$

$$t \quad \text{Balances}$$

20.

$$\frac{b}{o} \quad \frac{t}{h} \quad \text{Add } 8.$$

The solution is .

$$\frac{i}{d} \quad \frac{e}{s} \quad \text{Divide both sides by } 1.$$

Divide both

The solution is .

Check

Replace x with 5.
Balances

$$\frac{\quad}{\quad} \quad \frac{\quad}{\quad} \quad \text{Divide both sides by } 7.$$

The solution is.

Check

$\cdot (\quad)$ Replace w with 11.
Balances

$$\frac{\quad}{\quad} \quad \frac{\quad}{\quad} \quad \text{Divide both sides by } 1.$$

The solution is.

Check

• Replace p with 14.
Balances

22.

$$\frac{\quad}{\quad} \quad \frac{\quad}{\quad} \quad \text{Add } 2x \text{ to both sides.}$$

$$\frac{\quad}{\quad} \quad \frac{\quad}{\quad} \quad \text{Add } 9 \text{ to both sides.}$$

$$\frac{\quad}{\quad} \quad \frac{\quad}{\quad} \quad \text{Divide both sides by } 7.$$

The solution is.

23.

$$\frac{\quad}{\quad} \quad \frac{\quad}{\quad} \quad \text{Add } 3m \text{ to both sides.}$$

$$\frac{\quad}{\quad} \quad \frac{\quad}{\quad} \quad \text{Add } 13 \text{ to both sides.}$$

$$\frac{\quad}{\quad} \quad \frac{\quad}{\quad} \quad \text{Divide both sides by } 4.$$

The solution is .

$$\frac{\quad}{\quad} \quad \text{Divide both sides by 6.} \quad \text{Add } 6b \text{ to both sides.}$$

Cumulative Review Exercises (Chapters 1–2)

$\frac{\quad}{\quad}$, in words is ~~three hundred six billion, four thousand, two hundred ten.~~ ^{Add 42 to both sides.}

Eight hundred million, sixty-six thousand:

The solution is .
 (a) lies to the *right* of on the number line, so .

$$\frac{\quad}{\quad} \quad \text{Distribute.}$$

$$\frac{\quad}{\quad} \quad \text{Add 24 to both sides.}$$

$$\frac{\quad}{\quad} \quad \text{Divide both sides by 3.}$$

The solution is .
Addition property of equality: Start with a possible solution, for example, . Now add an arbitrary number, say , to both sides, to give us the equation .

Division property of equality: Start with a possible solution, for example, . Now multiply both sides by an arbitrary number, say , to give us the equation .

Thus, equations will vary. Two possibilities are
 and .

Solving:

$$\frac{\quad}{\quad} \quad \text{Add 5 to both sides.}$$

tive

property of addition: Changing the order of the addends does not change the sum.

(b) *Multiplication property of zero:* Multiplying any number by gives a product of

(c) *Distributive property:* Multiplication distributes over addition.

(a) Underline the hundreds place:

The next digit is or less, so leave as . Change and to

Underline the thousands place: ,
The next digit is or more, so add to , write the and add to the ten-thousands place. Change and to .

Change to addition.

6 is 6 units from 0.
4 is 4 units from 0.

Same sign, positive product

Same sign, positive product

10. *Same sign, positive quotient*

4 *Addition of a number and its opposite is zero.*

12. *Exponent*
Multiply left to right.

is undefined. Division by is undefined.

Different signs, negative product

82 Chapter 2 Understanding Variables and Solving Equations

Change to addition.

Different signs, negative quotient

Change to addition.

Multiply.

Add.

19. _____

Numerator:

Multiply.
Change to addition.
Add left to right.

Denominator:

• • Exponents

shares rounds to . \$
rounds to \$.
\$ stays \$ (it's a single digit number).

Each stock dropped in value by \$ and Doug owned shares. Multiply to find out how much money he lost. Then, subtract this amount from the original total value.

Estimate: \$•\$
Exact: \$•\$

His shares are now worth \$.

\$ rounds to \$. \$
rounds to \$.
months (in one year) rounds to .

Estimate: \$\$
\$\$

Exact: \$ \$ \$ \$

She will spend \$ for rent and parking in one year.

means • • • • •

means

• • • •
•••
•••
••
•

Replace x with 5
and y with 2.
Multiply left to right.

Last step is division: _____

days rounds to .
miles rounds to .
Average distance "per" day implies

division. Estimate: $\frac{\text{miles}}{\text{days}}$ miles per

$\frac{\text{miles}}{\text{day}}$ Exact: days miles per day

27.

Combine like terms.

or

The average distance the tiger traveled each day was miles.

degrees rounds to . "Rise" of
degrees rounds to .

A start temperature of degrees followed by a rise of degrees implies addition.

Estimate: degrees
Exact: degrees

The daytime temperature was degrees.

Write the understood coefficients of .
Change to addition.
Combine like terms.

29.

• Associative property

35.

_____ Add 2m to both sides.

• • Distribute.

_____ Add 6 to both sides.

_____ Divide both sides by 3.

The solution is .

or

Check

32.

_____ Add x to both sides.

_____ Divide both sides by 2.

The solution is.

Check

Replace x with 4.

Balances

_____ Add 2 to both sides.

Replace m with 4.

Add 18 to both sides.
Divide both sides by 14.
The solution is _____.

_____ _____
Divide both sides by 7.

_____ _____
Divide both sides by 1.
The solution is _____.

The solution is _____.

Check

Replace y with 6.

Balances

_____ _____
Add 1b to both sides.

_____ _____
Divide both sides by 3.

_____ _____
Add 1 to both sides.

_____ _____
Divide both sides by 2.

The solution is _____.

Check

Replace k with 7.

The solution is _____.

Balances

Copyright © 2014 Pearson Education, Inc.

40.

—

—

The solution is .

Add 2 to both sides.

Add 8t to both sides.

Divide both sides by 6.

—

—

The solution is .

Add 18.

Add 10y

Divide by 4.