

# ALGEBRAIC EXPRESSIONS AND EQUATIONS: EXERCISE SUPPLEMENT\*

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## Abstract

This module is from Fundamentals of Mathematics by Denny Burzynski and Wade Ellis, Jr. This module is an exercise supplement for the chapter "Algebraic Expressions and Equations" and contains many exercise problems. Odd problems are accompanied by solutions.

## 1 Exercise Supplement

### 1.1 Algebraic Expressions ( here<sup>1</sup>)

For problems 1-10, specify each term.

**Exercise 1** *(Solution on p. 9.)*

$$6a - 2b + 5c$$

**Exercise 2**

$$9x - 6y + 1$$

**Exercise 3**

$$7m - 3n$$

*(Solution on p. 9.)*

**Exercise 4**

$$-5h + 2k - 8 + 4m$$

**Exercise 5**

$$x + 2n - z$$

*(Solution on p. 9.)*

**Exercise 6**

$$y - 5$$

**Exercise 7**

$$-y - 3z$$

*(Solution on p. 9.)*

**Exercise 8**

$$-a - b - c - 1$$

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<sup>1</sup>"Algebraic Expressions and Equations: Algebraic Expressions" <<http://cnx.org/content/m35038/latest/>>

**Exercise 9** (Solution on p. 9.)  
-4

**Exercise 10**  
-6

**Exercise 11** (Solution on p. 9.)  
Write  $1k$  in a simpler way.

**Exercise 12**  
Write  $1x$  in a simpler way.

**Exercise 13** (Solution on p. 9.)  
In the expression  $7r$ , how many  $r$ 's are indicated?

**Exercise 14**  
In the expression  $12m$ , how many  $m$ 's are indicated?

**Exercise 15** (Solution on p. 9.)  
In the expression  $-5n$ , how many  $n$ 's are indicated?

**Exercise 16**  
In the expression  $-10y$ , how many  $y$ 's are indicated?

For problems 17-46, find the value of each expression.

**Exercise 17** (Solution on p. 9.)  
 $5a - 2s$ , if  $a = -5$  and  $s = 1$

**Exercise 18**  
 $7n - 3r$ , if  $n = -6$  and  $r = 2$

**Exercise 19** (Solution on p. 9.)  
 $9x + 2y - 3s$ , if  $x = -2$ ,  $y = 5$ , and  $s = -3$

**Exercise 20**  
 $10a - 2b + 5c$ , if  $a = 0$ ,  $b = -6$ , and  $c = 8$

**Exercise 21** (Solution on p. 9.)  
 $-5s - 2t + 1$ , if  $s = 2$  and  $t = -2$

**Exercise 22**  
 $-3m - 4n + 5$ , if  $m = -1$  and  $n = -1$

**Exercise 23** (Solution on p. 9.)  
 $m - 4$ , if  $m = 4$

**Exercise 24**  
 $n = 2$ , if  $n = 2$

**Exercise 25** (Solution on p. 9.)  
 $-x + 2y$ , if  $x = -7$  and  $y = -1$

**Exercise 26**  
 $-a + 3b - 6$ , if  $a = -3$  and  $b = 0$

**Exercise 27** (Solution on p. 9.)  
 $5x - 4y - 7y + y - 7x$ , if  $x = 1$  and  $y = -2$

**Exercise 28**  
 $2a - 6b - 3a - a + 2b$ , if  $a = 4$  and  $b = -2$

**Exercise 29** (Solution on p. 9.)  
 $a^2 - 6a + 4$ , if  $a = -2$

**Exercise 30**  
 $m^2 - 8m - 6$ , if  $m = -5$

**Exercise 31** (Solution on p. 9.)

$$4y^2 + 3y + 1, \text{ if } y = -2$$

**Exercise 32**

$$5a^2 - 6a + 11, \text{ if } a = 0$$

**Exercise 33**

$$-k^2 - k - 1, \text{ if } k = -1$$

(Solution on p. 9.)

**Exercise 34**

$$-h^2 - 2h - 3, \text{ if } h = -4$$

**Exercise 35**

$$\frac{m}{6} + 5m, \text{ if } m = -18$$

(Solution on p. 9.)

**Exercise 36**

$$\frac{a}{8} - 2a + 1, \text{ if } a = 24$$

**Exercise 37**

$$\frac{5x}{7} + 3x - 7, \text{ if } x = 14$$

(Solution on p. 9.)

**Exercise 38**

$$\frac{3k}{4} - 5k + 18, \text{ if } k = 16$$

**Exercise 39**

$$\frac{-6a}{5} + 3a + 10, \text{ if } a = 25$$

(Solution on p. 9.)

**Exercise 40**

$$\frac{-7h}{9} - 7h - 7, \text{ if } h = -18$$

**Exercise 41**

$$5(3a + 4b), \text{ if } a = -2 \text{ and } b = 2$$

(Solution on p. 9.)

**Exercise 42**

$$7(2y - x), \text{ if } x = -1 \text{ and } y = 2$$

**Exercise 43**

$$-(a - b), \text{ if } a = 0 \text{ and } b = -6$$

(Solution on p. 9.)

**Exercise 44**

$$-(x - x - y), \text{ if } x = 4 \text{ and } y = -4$$

**Exercise 45**

$$(y + 2)^2 - 6(y + 2) - 6, \text{ if } y = 2$$

(Solution on p. 9.)

**Exercise 46**

$$(a - 7)^2 - 2(a - 7) - 2, \text{ if } a = 7$$

## 1.2 Combining Like Terms Using Addition and Subtraction ( here<sup>2</sup>)

For problems 47-56, simplify each expression by combining like terms.

**Exercise 47**

$$4a + 5 - 2a + 1$$

(Solution on p. 9.)

**Exercise 48**

$$7x + 3x - 14x$$

**Exercise 49**

$$-7b + 4m - 3 + 3n$$

(Solution on p. 9.)

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<sup>2</sup>"Algebraic Expressions and Equations: Combining Like Terms Using Addition and Subtraction"  
<<http://cnx.org/content/m35039/latest/>>

**Exercise 50**

$$-9k - 8h - k + 6h$$

**Exercise 51**

$$-x + 5y - 8x - 6x + 7y$$

*(Solution on p. 10.)***Exercise 52**

$$6n - 2n + 6 - 2 - n$$

**Exercise 53**

$$0m + 3k - 5s + 2m - s$$

*(Solution on p. 10.)***Exercise 54**

$$| -8 | a + | 2 | b - | -4 | a$$

**Exercise 55**

$$| 6 | h - | -7 | k + | -12 | h + | 4 | \cdot | -5 | h$$

*(Solution on p. 10.)***Exercise 56**

$$| 0 | a - 0a + 0$$

### 1.3 Equations of the Form $ax = b$ and $\frac{x}{a} = b$ , Translating Words to Mathematical Symbols , and Solving Problems ( here<sup>3</sup>, here<sup>4</sup>, here<sup>5</sup>)

For problems 57-140, solve each equation.

**Exercise 57**

$$x + 1 = 5$$

*(Solution on p. 10.)***Exercise 58**

$$y - 3 = -7$$

**Exercise 59**

$$x + 12 = 10$$

*(Solution on p. 10.)***Exercise 60**

$$x - 4 = -6$$

**Exercise 61**

$$5x = 25$$

*(Solution on p. 10.)***Exercise 62**

$$3x = 17$$

**Exercise 63**

$$\frac{x}{2} = 6$$

*(Solution on p. 10.)***Exercise 64**

$$\frac{x}{-8} = 3$$

**Exercise 65**

$$\frac{x}{15} = -1$$

*(Solution on p. 10.)***Exercise 66**

$$\frac{x}{-4} = -3$$

**Exercise 67**

$$-3x = 9$$

*(Solution on p. 10.)*

<sup>3</sup>"Algebraic Expressions and Equations: Solving Equations of the Form  $ax=b$  and  $x/a=b$ "  
<<http://cnx.org/content/m35045/latest/>>

<sup>4</sup>"Algebraic Expressions and Equations: Applications I: Translating Words to Mathematical Symbols"  
<<http://cnx.org/content/m35046/latest/>>

<sup>5</sup>"Algebraic Expressions and Equations: Applications II: Solving Problems" <<http://cnx.org/content/m35047/latest/>>

**Exercise 68**

$$-2x = 5$$

**Exercise 69**

$$-5x = -5$$

*(Solution on p. 10.)***Exercise 70**

$$-3x = -1$$

**Exercise 71**

$$\frac{x}{-3} = 9$$

*(Solution on p. 10.)***Exercise 72**

$$\frac{a}{-5} = 2$$

**Exercise 73**

$$-7 = 3y$$

*(Solution on p. 10.)***Exercise 74**

$$-7 = \frac{x}{3}$$

**Exercise 75**

$$\frac{m}{4} = \frac{-2}{5}$$

*(Solution on p. 10.)***Exercise 76**

$$4y = \frac{1}{2}$$

**Exercise 77**

$$\frac{-1}{3} = -5x$$

*(Solution on p. 10.)***Exercise 78**

$$\frac{-1}{9} = \frac{k}{3}$$

**Exercise 79**

$$\frac{-1}{6} = \frac{s}{-6}$$

*(Solution on p. 10.)***Exercise 80**

$$\frac{0}{4} = 4s$$

**Exercise 81**

$$x + 2 = -1$$

*(Solution on p. 10.)***Exercise 82**

$$x - 5 = -6$$

**Exercise 83**

$$\frac{-3}{2}x = 6$$

*(Solution on p. 10.)***Exercise 84**

$$3x + 2 = 7$$

**Exercise 85**

$$-4x - 5 = -3$$

*(Solution on p. 10.)***Exercise 86**

$$\frac{x}{6} + 1 = 4$$

**Exercise 87**

$$\frac{a}{-5} - 3 = -2$$

*(Solution on p. 10.)***Exercise 88**

$$\frac{4x}{3} = 7$$

**Exercise 89**

$$\frac{2x}{5} + 2 = 8$$

*(Solution on p. 10.)*

**Exercise 90**

$$\frac{3y}{2} - 4 = 6$$

**Exercise 91**

$$m + 3 = 8$$

*(Solution on p. 10.)***Exercise 92**

$$\frac{1x}{2} = 2$$

**Exercise 93**

$$\frac{2a}{3} = 5$$

*(Solution on p. 10.)***Exercise 94**

$$\frac{-3x}{7} - 4 = 4$$

**Exercise 95**

$$\frac{5x}{-2} - 6 = -10$$

*(Solution on p. 10.)***Exercise 96**

$$-4k - 6 = 7$$

**Exercise 97**

$$\frac{-3x}{-2} + 1 = 4$$

*(Solution on p. 10.)***Exercise 98**

$$\frac{-6x}{4} = 2$$

**Exercise 99**

$$x + 9 = 14$$

*(Solution on p. 10.)***Exercise 100**

$$y + 5 = 21$$

**Exercise 101**

$$y + 5 = -7$$

*(Solution on p. 11.)***Exercise 102**

$$4x = 24$$

**Exercise 103**

$$4w = 37$$

*(Solution on p. 11.)***Exercise 104**

$$6y - 11 = 13$$

**Exercise 105**

$$-3x + 8 = -7$$

*(Solution on p. 11.)***Exercise 106**

$$3z + 9 = -51$$

**Exercise 107**

$$\frac{x}{-3} = 8$$

*(Solution on p. 11.)***Exercise 108**

$$\frac{6y}{7} = 5$$

**Exercise 109**

$$\frac{w}{2} - 15 = 4$$

*(Solution on p. 11.)***Exercise 110**

$$\frac{x}{-2} - 23 = -10$$

**Exercise 111**

$$\frac{2x}{3} - 5 = 8$$

*(Solution on p. 11.)*

**Exercise 112**

$$\frac{3z}{4} = \frac{-7}{8}$$

**Exercise 113**

$$-2 - \frac{2x}{7} = 3$$

*(Solution on p. 11.)***Exercise 114**

$$3 - x = 4$$

**Exercise 115**

$$-5 - y = -2$$

*(Solution on p. 11.)***Exercise 116**

$$3 - z = -2$$

**Exercise 117**

$$3x + 2x = 6$$

*(Solution on p. 11.)***Exercise 118**

$$4x + 1 + 6x = 10$$

**Exercise 119**

$$6y - 6 = -4 + 3y$$

*(Solution on p. 11.)***Exercise 120**

$$3 = 4a - 2a + a$$

**Exercise 121**

$$3m + 4 = 2m + 1$$

*(Solution on p. 11.)***Exercise 122**

$$5w - 6 = 4 + 2w$$

**Exercise 123**

$$8 - 3a = 32 - 2a$$

*(Solution on p. 11.)***Exercise 124**

$$5x - 2x + 6x = 13$$

**Exercise 125**

$$x + 2 = 3 - x$$

*(Solution on p. 11.)***Exercise 126**

$$5y + 2y - 1 = 6y$$

**Exercise 127**

$$x = 32$$

*(Solution on p. 11.)***Exercise 128**

$$k = -4$$

**Exercise 129**

$$\frac{3x}{2} + 4 = \frac{5x}{2} = 6$$

*(Solution on p. 11.)***Exercise 130**

$$\frac{x}{3} + \frac{3x}{3} - 2 = 16$$

*(Solution on p. 11.)***Exercise 131**

$$x - 2 = 6 - x$$

**Exercise 132**

$$\frac{-5x}{7} = \frac{2x}{7}$$

**Exercise 133**

$$\frac{2x}{3} + 1 = 5$$

*(Solution on p. 11.)*

**Exercise 134**

$$\frac{-3x}{5} + 3 = \frac{2x}{5} + 2$$

**Exercise 135**

$$\frac{3x}{4} + 5 = \frac{-3x}{4} - 11$$

*(Solution on p. 11.)***Exercise 136**

$$\frac{3x}{7} = \frac{-3x}{7} + 12$$

*(Solution on p. 11.)***Exercise 137**

$$\frac{5y}{13} - 4 = \frac{7y}{26} + 1$$

**Exercise 138**

$$\frac{-3m}{5} = \frac{6m}{10} - 2$$

**Exercise 139**

$$\frac{-3m}{2} + 1 = 5m$$

*(Solution on p. 11.)***Exercise 140**

$$-3z = \frac{2z}{5}$$



## Solutions to Exercises in this Module

**Solution to Exercise (p. 1)**

$6a, -2b, 5c$

**Solution to Exercise (p. 1)**

$7m, -3n$

**Solution to Exercise (p. 1)**

$x, 2n, -z$

**Solution to Exercise (p. 1)**

$-y, -3z$

**Solution to Exercise (p. 2)**

$-4$

**Solution to Exercise (p. 2)**

$k$

**Solution to Exercise (p. 2)**

$7$

**Solution to Exercise (p. 2)**

$-5$

**Solution to Exercise (p. 2)**

$-27$

**Solution to Exercise (p. 2)**

$1$

**Solution to Exercise (p. 2)**

$-5$

**Solution to Exercise (p. 2)**

$0$

**Solution to Exercise (p. 2)**

$5$

**Solution to Exercise (p. 2)**

$18$

**Solution to Exercise (p. 2)**

$20$

**Solution to Exercise (p. 3)**

$11$

**Solution to Exercise (p. 3)**

$-1$

**Solution to Exercise (p. 3)**

$-93$

**Solution to Exercise (p. 3)**

$45$

**Solution to Exercise (p. 3)**

$55$

**Solution to Exercise (p. 3)**

$10$

**Solution to Exercise (p. 3)**

$-6$

**Solution to Exercise (p. 3)**

$-14$

**Solution to Exercise (p. 3)**

$2a + 6$

**Solution to Exercise (p. 3)**

$$-4n + 4m - 3$$

**Solution to Exercise (p. 4)**

$$-15x + 12y$$

**Solution to Exercise (p. 4)**

$$3k + 2m - 6s$$

**Solution to Exercise (p. 4)**

$$38h - 7k$$

**Solution to Exercise (p. 4)**

$$x = 4$$

**Solution to Exercise (p. 4)**

$$x = -2$$

**Solution to Exercise (p. 4)**

$$x = 5$$

**Solution to Exercise (p. 4)**

$$x = 12$$

**Solution to Exercise (p. 4)**

$$x = -15$$

**Solution to Exercise (p. 4)**

$$x = -3$$

**Solution to Exercise (p. 5)**

$$x = 1$$

**Solution to Exercise (p. 5)**

$$x = -27$$

**Solution to Exercise (p. 5)**

$$y = -\frac{7}{3}$$

**Solution to Exercise (p. 5)**

$$m = -\frac{8}{5}$$

**Solution to Exercise (p. 5)**

$$x = \frac{1}{15}$$

**Solution to Exercise (p. 5)**

$$s = 1$$

**Solution to Exercise (p. 5)**

$$x = -3$$

**Solution to Exercise (p. 5)**

$$x = -4$$

**Solution to Exercise (p. 5)**

$$x = -\frac{1}{2}$$

**Solution to Exercise (p. 5)**

$$a = -5$$

**Solution to Exercise (p. 5)**

$$x = 15$$

**Solution to Exercise (p. 6)**

$$x = 5$$

**Solution to Exercise (p. 6)**

$$a = \frac{15}{2}$$

**Solution to Exercise (p. 6)**

$$x = \frac{8}{5}$$

**Solution to Exercise (p. 6)**

$$x = 2$$

**Solution to Exercise (p. 6)**

$$x = 5$$

**Solution to Exercise (p. 6)**

$$y = -12$$

**Solution to Exercise (p. 6)**

$$w = \frac{37}{4}$$

**Solution to Exercise (p. 6)**

$$x = 5$$

**Solution to Exercise (p. 6)**

$$x = -24$$

**Solution to Exercise (p. 6)**

$$w = 38$$

**Solution to Exercise (p. 6)**

$$x = \frac{39}{2}$$

**Solution to Exercise (p. 7)**

$$x = -\frac{35}{2}$$

**Solution to Exercise (p. 7)**

$$y = -3$$

**Solution to Exercise (p. 7)**

$$x = \frac{6}{5}$$

**Solution to Exercise (p. 7)**

$$y = \frac{2}{3}$$

**Solution to Exercise (p. 7)**

$$m = -3$$

**Solution to Exercise (p. 7)**

$$a = -24$$

**Solution to Exercise (p. 7)**

$$x = \frac{1}{2}$$

**Solution to Exercise (p. 7)**

$$x = 32$$

**Solution to Exercise (p. 7)**

$$x = -2$$

**Solution to Exercise (p. 7)**

$$x = 4$$

**Solution to Exercise (p. 7)**

$$x = 6$$

**Solution to Exercise (p. 8)**

$$x = \frac{-32}{3}$$

**Solution to Exercise (p. 8)**

$$y = \frac{130}{3}$$

**Solution to Exercise (p. 8)**

$$m = \frac{2}{13}$$