

# ALGEBRAIC EXPRESSIONS AND EQUATIONS: PROFICIENCY EXAM\*

Wade Ellis  
Denny Burzynski

This work is produced by The Connexions Project and licensed under the Creative Commons Attribution License †

## Abstract

This module is from Fundamentals of Mathematics by Denny Burzynski and Wade Ellis, Jr. This module is a proficiency exam to the chapter "Algebraic Expressions and Equations." Each problem is accompanied with a reference link pointing back to the module that discusses the type of problem demonstrated in the question. The problems in this exam are accompanied by solutions.

## 1 Proficiency Exam

For problems 1 and 2 specify each term.

**Exercise 1** *(Solution on p. 4.)*  
( here<sup>1</sup>)  $5x + 6y + 3z$

**Exercise 2** *(Solution on p. 4.)*  
( here<sup>2</sup>)  $8m - 2n - 4$

**Exercise 3** *(Solution on p. 4.)*  
( here<sup>3</sup>) In the expression  $-9a$ , how many  $a$ 's are indicated?

For problems 4-9, find the value of each expression.

**Exercise 4** *(Solution on p. 4.)*  
( here<sup>4</sup>)  $6a - 3b$ , if  $a = -2$ , and  $b = -1$ .

**Exercise 5** *(Solution on p. 4.)*  
( here<sup>5</sup>)  $-5m + 2n - 6$ , if  $m = -1$  and  $n = 4$ .

**Exercise 6** *(Solution on p. 4.)*  
( here<sup>6</sup>)  $-x^2 + 3x - 5$ , if  $x = -2$ .

---

\*Version 1.2: Aug 18, 2010 8:15 pm -0500

†<http://creativecommons.org/licenses/by/3.0/>

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

<sup>2</sup>"Algebraic Expressions and Equations: Algebraic Expressions" <<http://cnx.org/content/m35038/latest/>>

<sup>3</sup>"Algebraic Expressions and Equations: Algebraic Expressions" <<http://cnx.org/content/m35038/latest/>>

<sup>4</sup>"Algebraic Expressions and Equations: Algebraic Expressions" <<http://cnx.org/content/m35038/latest/>>

<sup>5</sup>"Algebraic Expressions and Equations: Algebraic Expressions" <<http://cnx.org/content/m35038/latest/>>

<sup>6</sup>"Algebraic Expressions and Equations: Algebraic Expressions" <<http://cnx.org/content/m35038/latest/>>

**Exercise 7** ( here<sup>7</sup>)  $y^2 + 9y + 1$ , if  $y = 0$ . *(Solution on p. 4.)*

**Exercise 8** ( here<sup>8</sup>)  $-a^2 + 3a + 4$ , if  $a = 4$ . *(Solution on p. 4.)*

**Exercise 9** ( here<sup>9</sup>)  $-(5-x)^2 + 7(m-x) + x - 2m$ , if  $x = 5$  and  $m = 5$ . *(Solution on p. 4.)*

For problems 10-12, simplify each expression by combining like terms.

**Exercise 10** ( here<sup>10</sup>)  $6y + 5 - 2y + 1$  *(Solution on p. 4.)*

**Exercise 11** ( here<sup>11</sup>)  $14a - 3b + 5b - 6a - b$  *(Solution on p. 4.)*

**Exercise 12** ( here<sup>12</sup>)  $9x + 5y - 7 + 4x - 6y + 3(-2)$  *(Solution on p. 4.)*

For problems 13-22, solve each equation.

**Exercise 13** ( here<sup>13</sup>)  $x + 7 = 15$  *(Solution on p. 4.)*

**Exercise 14** ( here<sup>14</sup>)  $y - 6 = 2$  *(Solution on p. 4.)*

**Exercise 15** ( here<sup>15</sup>)  $m + 8 = -1$  *(Solution on p. 4.)*

**Exercise 16** ( here<sup>16</sup>)  $-5 + a = -4$  *(Solution on p. 4.)*

**Exercise 17** ( here<sup>17</sup>)  $4x = 104$  *(Solution on p. 4.)*

**Exercise 18** ( here<sup>18</sup>)  $6y + 3 = -21$  *(Solution on p. 4.)*

**Exercise 19** ( here<sup>19</sup>)  $\frac{5m}{6} = \frac{10}{3}$  *(Solution on p. 4.)*

<sup>7</sup>"Algebraic Expressions and Equations: Algebraic Expressions" <<http://cnx.org/content/m35038/latest/>>

<sup>8</sup>"Algebraic Expressions and Equations: Algebraic Expressions" <<http://cnx.org/content/m35038/latest/>>

<sup>9</sup>"Algebraic Expressions and Equations: Algebraic Expressions" <<http://cnx.org/content/m35038/latest/>>

<sup>10</sup>"Algebraic Expressions and Equations: Combining Like Terms Using Addition and Subtraction" <<http://cnx.org/content/m35039/latest/>>

<sup>11</sup>"Algebraic Expressions and Equations: Combining Like Terms Using Addition and Subtraction" <<http://cnx.org/content/m35039/latest/>>

<sup>12</sup>"Algebraic Expressions and Equations: Combining Like Terms Using Addition and Subtraction" <<http://cnx.org/content/m35039/latest/>>

<sup>13</sup>"Algebraic Expressions and Equations: Solving Equations of the Form  $x+a=b$  and  $x-a=b$ " <<http://cnx.org/content/m35044/latest/>>

<sup>14</sup>"Algebraic Expressions and Equations: Solving Equations of the Form  $x+a=b$  and  $x-a=b$ " <<http://cnx.org/content/m35044/latest/>>

<sup>15</sup>"Algebraic Expressions and Equations: Solving Equations of the Form  $x+a=b$  and  $x-a=b$ " <<http://cnx.org/content/m35044/latest/>>

<sup>16</sup>"Algebraic Expressions and Equations: Solving Equations of the Form  $x+a=b$  and  $x-a=b$ " <<http://cnx.org/content/m35044/latest/>>

<sup>17</sup>"Algebraic Expressions and Equations: Solving Equations of the Form  $ax=b$  and  $x/a=b$ " <<http://cnx.org/content/m35045/latest/>>

<sup>18</sup>"Algebraic Expressions and Equations: Solving Equations of the Form  $ax=b$  and  $x/a=b$ " <<http://cnx.org/content/m35045/latest/>>

<sup>19</sup>"Algebraic Expressions and Equations: Solving Equations of the Form  $ax=b$  and  $x/a=b$ " <<http://cnx.org/content/m35045/latest/>>

**Exercise 20** *(Solution on p. 4.)*

( here<sup>20</sup>)  $\frac{7y}{8} + \frac{1}{4} = \frac{-13}{4}$

**Exercise 21** *(Solution on p. 4.)*

( here<sup>21</sup>)  $6x + 5 = 4x - 11$

**Exercise 22** *(Solution on p. 4.)*

( here<sup>22</sup>)  $4y - 8 - 6y = 3y + 1$

**Exercise 23** *(Solution on p. 4.)*

( here<sup>23</sup> and here<sup>24</sup>) Three consecutive even integers add to -36. What are they?

**Exercise 24** *(Solution on p. 4.)*

( here<sup>25</sup> and here<sup>26</sup>) The perimeter of a rectangle is 38 feet. Find the length and width of the rectangle if the length is 5 feet less than three times the width.

**Exercise 25** *(Solution on p. 4.)*

( here<sup>27</sup> and here<sup>28</sup>) Four numbers add to -2. The second number is three more than twice the negative of the first number. The third number is six less than the first number. The fourth number is eleven less than twice the first number. Find the numbers.

---

<sup>20</sup>"Algebraic Expressions and Equations: Solving Equations of the Form  $ax=b$  and  $x/a=b$ "  
<<http://cnx.org/content/m35045/latest/>>

<sup>21</sup>"Algebraic Expressions and Equations: Solving Equations of the Form  $ax=b$  and  $x/a=b$ "  
<<http://cnx.org/content/m35045/latest/>>

<sup>22</sup>"Algebraic Expressions and Equations: Solving Equations of the Form  $ax=b$  and  $x/a=b$ "  
<<http://cnx.org/content/m35045/latest/>>

<sup>23</sup>"Algebraic Expressions and Equations: Applications I: Translating Words to Mathematical Symbols"  
<<http://cnx.org/content/m35046/latest/>>

<sup>24</sup>"Algebraic Expressions and Equations: Applications II: Solving Problems" <<http://cnx.org/content/m35047/latest/>>

<sup>25</sup>"Algebraic Expressions and Equations: Applications I: Translating Words to Mathematical Symbols"  
<<http://cnx.org/content/m35046/latest/>>

<sup>26</sup>"Algebraic Expressions and Equations: Applications II: Solving Problems" <<http://cnx.org/content/m35047/latest/>>

<sup>27</sup>"Algebraic Expressions and Equations: Applications I: Translating Words to Mathematical Symbols"

<<http://cnx.org/content/m35046/latest/>>

<sup>28</sup>"Algebraic Expressions and Equations: Applications II: Solving Problems" <<http://cnx.org/content/m35047/latest/>>

## Solutions to Exercises in this Module

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

$$5x, 6y, 3z$$

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

$$8m, -2n, -4$$

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

$$-9$$

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

$$-9$$

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

$$7$$

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

$$-15$$

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

$$1$$

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

$$0$$

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

$$-5$$

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

$$4y + 6$$

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

$$8a + b$$

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

$$13x - y - 13$$

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

$$x = 8$$

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

$$y = 8$$

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

$$m = -9$$

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

$$a = 1$$

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

$$x = 26$$

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

$$y = -4$$

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

$$m = 4$$

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

$$y = -4$$

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

$$x = -8$$

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

$$y = \frac{-9}{5}$$

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

$$-14, -12, -10$$

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

$$l = 13, w = 6$$

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

6, -9, 0, 1