

Required Algebraic Skills

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Psychology 310 — Course Goals and Strategy

- 1 Introduction
- 2 Key Required Skills
 - Manipulating Equations
 - Manipulating and Eliminating Parentheses
 - Completing the Square
 - Computing Symbolic Products
- 3 Getting Remedial Help

Introduction

- Certain basic skills from high school algebra are required to participate effectively in Psychology 310.
- These examples will help you identify whether you have these skills.
- If you find the examples difficult, you will need to take immediate steps to (re-)acquire the appropriate background.

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- Completing the square
- Computing symbolic products

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Manipulating Equations

Suppose

$$Y = 3X - 5 \tag{1}$$

Solve for X .

Manipulating Equations

Solution.

$$Y = 3X - 5 \quad (2)$$

We start by adding 5 to both sides of the equation.

$$Y + 5 = 3X \quad (3)$$

Next, we divide both sides of the equation by 3, isolating X alone and completing the solution

$$\frac{Y + 5}{3} = X \quad (4)$$

Manipulating and Eliminating Parentheses

- Consider the following

$$2(X - 3Y + 7) \tag{5}$$

- Simplify the expression by removing the parentheses

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Manipulating and Eliminating Parentheses

Solution. Distribute the 2 as a multiplier to each term, obtaining

$$2X - 6Y + 14 \quad (6)$$

Manipulating and Eliminating Parentheses

- Consider the following

$$-(4X - 3Y + 7) \tag{7}$$

- Simplify the expression by removing the minus sign and the parentheses

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$$-(4X - 3Y + 7) \tag{7}$$

- Simplify the expression by removing the minus sign and the parentheses

Manipulating and Eliminating Parentheses

Solution. Distribute the minus sign as a multiplier of -1 to each term, effectively reversing the sign of each term and obtaining

$$-4X + 3Y - 7 \quad (8)$$

Completing the Square

Expand the following:

$$(A + B)^2 \quad (9)$$

Completing the Square

Solution.

$$A^2 + B^2 + 2AB \qquad (10)$$

Completing the Square

Expand the following:

$$(2A - 3B)^2 \qquad (11)$$

Completing the Square

Solution.

$$4A^2 + 9B^2 - 12AB \qquad (12)$$

Computing Symbolic Products

Expand the following:

$$(X + Y)(X - Y) \qquad (13)$$

Computing Symbolic Products

Solution:

$$X^2 - Y^2 \tag{14}$$

Getting Remedial Help

- If you cannot process the preceding sample problems, you need to work on your algebra skills to optimize your chances of success in Psychology 310 and subsequent statistics courses.
- There are a number of online resources available.
- One particularly innovative website with a vast range of lectures and support materials is at *www.khanacademy.org/*.
- Other sites include *<http://www.hippocampus.org/Algebra>* and *<http://www.themathpage.com/alg/algebra.htm>*.

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