Introduction

Welcome to the Algebra Diagnostic Assessment, designed to evaluate your understanding of basic algebraic concepts, application of mathematical operations, and ability to solve linear equations. This 45-minute assessment consists of multiple-choice, short answer, and essay questions to provide a comprehensive understanding of your knowledge and skills in algebra.

Section 1: Multiple Choice Questions

Choose the correct answer for each question. You have 15 minutes to complete this section.

1. Simplify the expression: $2x + 5 - 3x$
   1. a) $-x + 5$
   2. b) $x + 5$
   3. c) $-x - 5$
   4. d) $x - 5$
2. Solve the equation: $x + 2 = 7$
   1. a) $x = 5$
   2. b) $x = 9$
   3. c) $x = 3$
   4. d) $x = 1$
3. Graph the equation: $y = 2x - 1$
   1. a) Line with a slope of 2 and y-intercept of -1
   2. b) Line with a slope of 1 and y-intercept of 2
   3. c) Line with a slope of -2 and y-intercept of 1
   4. d) Line with a slope of -1 and y-intercept of -2
4. Identify the slope of the equation: $y = 3x - 2$
   1. a) 2
   2. b) 3
   3. c) -2
   4. d) -3
5. Solve the equation: $2x - 5 = 11$
   1. a) $x = 8$
   2. b) $x = 6$
   3. c) $x = 4$
   4. d) $x = 2$
6. Simplify the expression: $x^2 + 4x + 4$
   1. a) $(x + 2)^2$
   2. b) $(x - 2)^2$
   3. c) $x^2 - 4x + 4$
   4. d) $x^2 + 4x - 4$
7. Solve the equation: $x/2 + 3 = 5$
   1. a) $x = 4$
   2. b) $x = 6$
   3. c) $x = 8$
   4. d) $x = 10$
8. Graph the equation: $x - 2y = 3$
   1. a) Line with a slope of 1/2 and y-intercept of -3/2
   2. b) Line with a slope of -1/2 and y-intercept of 3/2
   3. c) Line with a slope of 2 and y-intercept of -3
   4. d) Line with a slope of -2 and y-intercept of 3
9. Identify the y-intercept of the equation: $y = 2x - 3$
   1. a) -3
   2. b) 2
   3. c) 3

4. d) -2

10. Solve the equation: x - 2 = 9
    1. a) x = 11
    2. b) x = 7
    3. c) x = 5
    4. d) x = 3

Section 2: Short Answer Questions

Answer each question in the space provided. You have 15 minutes to complete this section.

1. Solve the equation: 2x + 5 = 11

2. Simplify the expression: $x^2 + 2x - 6$

3. Identify the slope and y-intercept of the equation: y = 3x - 2
   Slope:

   Y-intercept:

4. Solve the equation: x/3 + 2 = 5

5. Graph the equation: y = x - 2

Section 3: Essay Question

Answer the question in the space provided. You have 15 minutes to complete this section.

Solve the equation: 2x + 5 = 11 and explain your reasoning. Use algebraic concepts to model a real-world problem.

Marking Guide

The marking guide is provided to help teachers assess student performance. The actual marking scheme may vary depending on the specific requirements of the assessment.

- Section 1: Multiple Choice Questions (1 mark each)
- Section 2: Short Answer Questions (2-3 marks each)
- Section 3: Essay Question (10 marks for content knowledge and application of algebraic concepts, 5 marks for clarity and concision of writing, and 5 marks for accuracy of mathematical calculations)