JESUIT HIGH SCHOOL MATH DEPARTMENT

INFORMATION ABOUT THE
INTRO TO ALGEBRA (PRE-ALGEBRA) CHALLENGE EXAM
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PRACTICE PROBLEMS

The exam is 25 items long, and takes about 1 hour to complete.
Use of calculators is not allowed on any portion of the exam.

The Intro to Algebra Challenge Exam covers the following topics:

- Evaluating expressions using the *Order of Operations*
- Adding, subtracting, multiplying, and dividing fractions
- Adding, subtracting, multiplying, and dividing decimals
- Adding, subtracting, multiplying, and dividing integers
- Using percents to solve fundamental problems
- Determining the slope of a line given two points
- Solving linear equations
- Solving linear inequalities
- Adding and subtracting rational polynomials
- Multiplying and dividing rational polynomials
- Demonstrate fundamental knowledge of scientific notation
- Knowledge of the coordinate system
- Properties of exponents
- Demonstrate fundamental knowledge of sequences
- Find the average of a set of integers
- Demonstrate fundamental knowledge of factoring

Intro to Algebra (Pre-Algebra) Challenge Exam Practice Problems

The following are examples of some of the problems with which students should be familiar from a Pre-Algebra course. For the exam, students should be able to show appropriate steps in the process of solving or responding to each question.

1. Find the value of
   $24 + 8 \div 4 + 7$

2. Evaluate
   $(3x^{-1})^2$ for $x = 2$

3. Find the x-intercept
   $4x-3y=-12$

4. Find the slope of the line
   through (7,-1) and (-2,5)

5. Find the next term in the sequence
   0.1 , 0.3 , 0.7 , 1.3 , 2.1 , ____

6. Find the average of the following set
   13, -4, 0, 11, -9, 7, -1, 8

7. Find the product of
   $(3x^2)(-5xy^3)$

8. Simplify
   $-2x + 7y - 5y + x$

9. Solve
   $x - 25 = -9$

10. Solve
    $-4 = -44q$

11. Prime factorize
    48

12. Find the GCF
    $12x^3$ and $20x^2$

13. Simplify
    $-2(2x-6) + 3(x-4)$

14. Solve
    $23 + 4x < 2x - 7$

15. Write in scientific notation
    78,361

16. Factor
    $8x-24$

17. Evaluate
    $(-5)(4)(-1)(6)$

18. Evaluate
    $-4 + 5 - (-7) + (-9)$

19. Simplify
    $(3x - 3) - (x + 7)$

20. Evaluate for $x = 2$, $y = -3$, $z = 4$
    $(2x - y) + (3y + z)$