

ALGEBRA

The student will be able to:

1. Apply the principles of algebra.

- Demonstrate an understanding of integers
 - Identify concrete and symbolic representations of integers to real world situations such as temperature
 - Locate positive and negative integers on a number line
 - Understand the relative size of integers
 - Add, subtract, multiply, and divide integers
- Correctly use the algebraic order of operations
- Compute exponents and perfect square roots
- Use scientific notation
- Write numerical expressions such as six times five divided by two equals $6 \times 5 / 2$
- Write algebraic expressions (a numerical expression that contains a variable) such as: five plus some number minus six $5 + n - 6$
- Evaluate algebraic expressions when given the value of the variable such as: Solve $(x + 7) / 2$ if $x = 9$
- Solve one-step equations such as: $5n = 30$
- Solve two- step equations such as: $5n + 6 = 36$
- Simplify algebraic expressions by combining like terms such as: $a(b+c) = ab+ac$
- Use formulas, though a formula page is included with the GED Test, students must choose the correct formula and know how to use it
- Use a calculator to solve numerical expressions such as: $6^2 - (3 + 7) + 9/3 =$

2. Apply appropriate strategies for solving word problems that involve algebra.

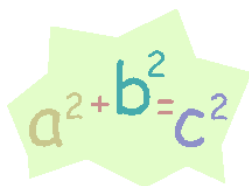
- Read the problem several times
- Personalize the problem
- Draw a picture or diagram to help solve the problem
- Eliminate extraneous information
- Use estimation to solve problems and assess the reasonableness of the answer
- Determine the number of steps and operations needed to solve the problem- Students will often stop after the first step, leading them to choose the wrong answer
- Choose the correct formula (if needed) to solve the problem
- Translate word problems into algebraic expressions to solve the problem
- Be able to choose the correct “set up” to solve a problem. On the GED Test you sometimes only need to choose the correct expression to solve the problem and not actually solve it
- Check all answers by fitting them back into the equation
- Use the answer choices and work backwards to find the correct answer
- Determine if the answer makes sense

Recommendations for teaching algebra for the GED test:

- Weave algebra instruction into other math topics to ease student's fear.
For example, solve 1-step equations when practicing whole number computation.
 $n + 5 = 12$ $n = 7$
- Replacing variables with a question mark may help students understand the concept.
 $? + 5 = 7$
- Be sure that students are familiar with symbols used in algebra, such as $<$, $>$, \leq , \geq , \equiv
- Be sure that the students are aware of the different ways to represent multiplication.
 $a \times b$, $a \cdot b$, ab , $a(b)$, and division $x \div y$ and x / y
- Practice writing equations to solve word problems
- When all else fails, fit the multiple choice answers into the equation to come up with the correct answer
- The GED test covers beginning algebra skills. Students who want to continue their education will most likely need to take an algebra class. Many adult education programs offer algebra diploma classes and college transition courses.

Essential Algebra Vocabulary:

- **Coefficient:** a constant that is being multiplied by a variable or by another expression such as $7n$, $7(n+42)$, 7 is the coefficient.
- **Constant:** remains the same, such as $35 + n$, n is the constant
- **Equation:** describes two equal values such as $36 \times 14 = 504$
- **Exponent:** a number that tells how many times the base (of a power) is written in the product, such as 5^2 , 2 is the exponent
- **Expression:** a mathematical phrase such as 36×14
- **Inequality:** compares two values that may or may not be equal, such as $36 \times 14 \geq 500$
- **Integers:** all positive and negative counting numbers including 0
- **Solution:** replaces the variable to produce a true equation, such as $n + 19 = 21$, $n = 2$
- **Variable:** a letter in place of a number, the value will be different in different equations, such as $n + 7 = 32$


$$a^2 + b^2 = c^2$$

Beginning Algebra Assessment 1

Exponents

1. $6^2 =$	2. $5^2 =$	3. $5^3 =$
4. $2^3 =$	5. $4^2 =$	6. $7^2 =$

Find the square root.

7. $\sqrt{36}$	8. $\sqrt{25}$	9. $\sqrt{4}$
10. $\sqrt{100}$	11. $\sqrt{81}$	12. $\sqrt{64}$

Order of operations

13. $4^2 - 7 \times 2 - (5 + 3) =$	14. $21 \div 3 + (2 \times 5 + 4) =$
15. $26 - 3 \times 2^2 =$	16. $5 + 54 \div 9 =$
17. $(48 \div 3 + 4) + (49 \div 7) =$	18. $8 - 4 \times 2 + 12 =$

Solve for N

19. $N + 12 = 25$

21. $N \times 10 = 100$

20. $N - 12 = 25$

22. $N / 5 = 50$

Complete by evaluating each expression.

23. $7m - 3$ $m = 3$	24. $2n + 6$ $n = 5$	25. $4r - 4$ $r = 2$
26. $3x - 10$ $x = 8$	27. $8d + 21$ $d = 6$	28. $9w + 27$ $w = 4$
29. $q \div 4$ $q = 8$	30. $36 / t$ $t = 3$	31. $5h$ $h = 6$

Solve each equation.

32. $N - 54 = 216$	33. $12N = 108$	34. $N + 28 = 240$
35. $32/N = 4$	36. $N(6) = 42$	37. $x + 71 = 160$
38. $N/10 = 120$	39. $84 = N - 34$	40. $N + 37 = 99$
41. $N \div 15 = 9$	42. $68 + N = 124$	43. $360 = 20N$

Name _____

Date _____

Algebra Assessment 2**Express each phrase as an algebraic expression.**

1. a number u times 5 plus 6	2. 2 times a number y less 36
3. 28 plus a number t divided by 3	4. difference of 47 and a number k

Combine like terms.

5. $5x + 3x$	6. $7y + y$
7. $3n \times 2n$	8. $5t - 2t + 6t$

Solve.

9. $j - 9 + 2 = 4$	10. $N \times 9 - 5 = 85$	11. $2 \times 7 + a = 34$
12. $10 / 2 - g = 2$	13. $b + 12 / 3 = 28$	14. $h - 37 + 3 = 55$

Rewrite the number in scientific notation.

15. 50,000	16. 60,000,000	17. 150,000
18. 0.0004	19. .000015	20. 0.000321

State whether the value for the unknown makes the inequality true or false.

21. $125 < 12x$ $x = 10$	22. $14 > \frac{a}{10}$ $a = 140$	23. $7 \geq \frac{99}{w}$ $w = 11$
24. $15 + b \leq 28$ $b = 6$	25. $75 \leq 15j$ $j = 8$	26. $12 > 27 - q$ $q = 19$

27. Two numbers have a sum of 18. One number is 4 more than the other. What is the value of the larger number? _____

28. Deanna is twice as old as her brother. If the difference in their ages is 7 years, how old is Deanna? a) 5 b) 7 c) 12 d) 14 e) 10

29. Ten less than a number is equal to the same number divided by 2. What is the number? a) 8 b) 10 c) 14 d) 20 e) 28

30. A jet travels an average 200 miles per hour. At this rate, how many hours will it for the jet to travel 1000 miles? _____

Student Inventory Algebra

Name _____ Date _____

*Answer each question below by putting a check mark after Yes or I need more work.
If you check yes, prove it by answering the question.*

1. **I can add, subtract, multiply and divide integers.**

$-6 + 8 =$ _____ $10 - (-5) =$ _____ $-6 \times 5 =$ _____ $-12 \div -6 =$ _____

Yes _____ I need more work _____

2. **I know the order of operations.**

$10 - 3(2) + 10 =$ _____

Yes _____ I need more work _____

3. **I can compute exponents and square roots.**

$5^2 =$ _____ $\sqrt{36} =$ _____

Yes _____ I need more work _____

4. **I can use scientific notation.**

$15,000,000 =$ _____ $1.5 \times 10^6 =$ _____

Yes _____ I need more work _____

5. **I can evaluate algebraic expressions.**

If $X = 10$, What is $(12 + 30) - 3X + 2 =$ _____

Yes _____ I need more work _____

6. **I can solve 1-step equations.**

$X + 12 = 50$ _____ $15.2 - X = 8$ _____ $8X = 56$ _____ $26/X = 13$ _____

Yes _____ I need more work _____

7. **I can solve 2-step equations.**

$X - 10 + 6 - 3 = 23$ $X =$ _____

Yes _____ I need more work _____

8. **I can simplify algebraic expressions by combining like terms.**

$5(2x + 3x) =$ _____

Yes _____ I need more work _____

9. **I can solve word problems that involve algebra.**

Yes _____ I need more work _____