

Course Readiness

Prerequisite self-check for Intro to Algebra 1

Intro to Algebra 1 begins beyond routine school exercises. Students should already be comfortable manipulating expressions, solving equations, working with exponents and radicals, and translating short problems into algebra. The questions below are intentionally a little more demanding than a basic school review.

This is a readiness check, not an entrance examination. Try all ten problems without a calculator and show enough work to make your reasoning clear. Answers appear on the final page.

1. Simplify:

$$4(2x - 3) - 3(x + 5) + 2(1 - x).$$

2. Solve for x :

$$\frac{2x - 3}{5} - \frac{x + 1}{3} = 1.$$

3. Simplify:

$$\frac{(2^3)^4 \cdot 2^{-5}}{4^2}.$$

4. Factor completely:

$$6x^2 - x - 2.$$

5. Simplify:

$$\sqrt{180} - 2\sqrt{20}.$$

6. Simplify the expression and state all restrictions on x :

$$\frac{x^2 - 9}{x^2 - x - 6}.$$

7. Solve the system:

$$\begin{aligned} 2x + 3y &= 17, \\ x - y &= 1. \end{aligned}$$

8. If $a + b = 9$ and $ab = 14$, find $a^2 + b^2$.

9. Solve for x , where $x \neq 0$:

$$x + \frac{12}{x} = 7.$$

10. A two-digit number has digit sum 11. The number is 27 greater than the number obtained by reversing its digits. Find the original number.

Answer Key

The answers below are intentionally brief. In the course, class discussions and problem sets will emphasize structure, efficient methods, and complete mathematical explanations.

1. $3x - 25$.

2. $x = 29$.

3. 8.

4. $(3x - 2)(2x + 1)$.

5. $2\sqrt{5}$.

6. $\frac{x+3}{x+2}$, with $x \neq 3$ and $x \neq -2$.

7. $x = 4$ and $y = 3$.

8. 53, since

$$a^2 + b^2 = (a + b)^2 - 2ab = 81 - 28.$$

9. $x = 3$ or $x = 4$.

10. 74. If the tens digit is a and the units digit is b , then

$$a + b = 11, \quad 9(a - b) = 27,$$

so $a - b = 3$, giving $a = 7$ and $b = 4$.

What is not required before the course?

You do not need prior knowledge of advanced factorization, the Fundamental Theorem of Algebra, Vieta's relations, range problems, rational inequalities, floor functions, or logarithmic problem solving. These ideas are developed in Intro to Algebra 1.