Supercharged Math Placement Test for Algebra 2

Congratulations on completing Algebra 1 and Geometry!

Before your child moves on to the more advanced topics in Algebra 2, it's important to ensure they have a solid grasp of the concepts learned in Algebra 1 and Geometry.

> Algebra 1 provides the foundation for solving equations and working with exponents, while Geometry introduces crucial spatial reasoning and theorems related to shapes, angles, and proofs. These skills are essential for understanding the more complex material in Algebra 2, where topics like quadratic equations, functions, and systems of equations build upon both algebraic and geometric principles.
>
> Geometry and Algebra are both critical parts of the learning process that helps strengthen problem-solving skills and logical thinking. This test will help identify any gaps in your child's knowledge so that they are fully prepared for the challenges of Algebra 2.

Ensuring that your child has mastered both Algebra 1 and Geometry will set them up for success and build the confidence they need to excel in future math courses (including Algebra 2). **Students that score 85% or higher on the assessment are ready for Algebra 2.**

Answer key is on the last page.

Factor the following polynomials using any method:

1. $x^2 + 7x + 10$
2. $x^2 - 3x - 10$
3. $x^2 - 8x + 15$

Solve the following by completing the square:

4. $x^2 + 6x + 5 = 0$
5. $x^2 + 10x + 21 = 0$

6. Simplify:

$$\frac{\sqrt{3} + \sqrt{75}}{5}$$

7. Solve:

$$\sqrt{5p - 7} - 6 = -4$$

Use the quadratic formula to solve for x:

8. $2x^2 - 3x - 5 = 0$
9. $x^2 + 4x + 1 = 0$

10. A single sided die is rolled four times. What is the probability that a 5 will appear all four times?

11. Find the equation of the line that passes through (-2, 3) and is perpendicular to $y = ¼ x - 2$

12. The number of blue candies varies inversely as the square of the number of red candies. Initially, when there are 8 blue candies, there were 5 reds. How many blues would there be if there were 10 red?

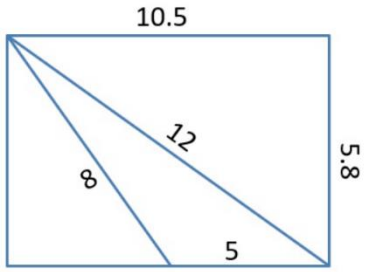
13. Graph the linear inequality:
    $y < -\frac{3}{4}x + 2$

14. Solve for y: $y - 14 = -3x$ and $5y = x + 6$

15. Simplify: $(3 + \sqrt{5})(\sqrt{5} - 2)$

16. Solve the equation: $\frac{3x}{4} - \frac{2x-1}{5} = 6$

17. What is the area of the obtuse triangle?



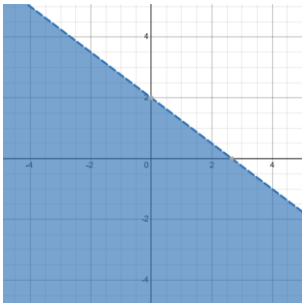
18. What is the diameter of a sphere measuring 260 billion cubic miles?

Factor by grouping:

19. $xy + 3x - 2y - 6$

20. $4ab - 8a + 6b - 12$

Answers:

1. (x+2) (x+5)
2. (x-5) (x+2)
3. (x-3) (x-5)
4. x = -1, -5
5. x = -3, -7
6. $\frac{6\sqrt{3}}{5}$
7. $\frac{11}{5}$
8. x = 2.5, -1
9. $x = -2 \pm \sqrt{3}$
10. $\frac{1}{6^4} = \frac{1}{1296}$
11. y = -4x – 5
12. 2
13. 
14. y = 2
15. $\sqrt{5} - 1$
16. 116/7 = 16.57
17. 14.5
18. 7,912 miles (or 7,919 miles with rounding)
19. (x – 2) (y + 3)
20. 2 (2a+ 3) (b – 2)