Geometry Honors Summer Assignment 2026

This assignment is designed for you to practice topics learned in Algebra 1 that will be relevant in the Honors Geometry curriculum.

You should bring the completed assignment along with any questions to class on the first day of school. Your questions will be reviewed during the initial days of school. An assessment on the assignment will be given at the conclusion of the first week of school.

Geometry Honors Summer Packet

Slope and Equations of Lines

Slope-Intercept Form: $y = mx + b$

Standard Form: $ax + by = c$, where a, b, and c are integers and $a \geq 0$.

Point-Slope Form: $y - y_1 = m(x - x_1)$

Equation of a Vertical Line: $x = c$, where c is any real number.

Equation of a Horizontal Line: $y = c$, where c is any real number.

Neatly show all work. Use the indicated form. Box in your final answers.

1. Write the following in **slope-intercept form**:

$$3x - 4y - 5 = 0$$

2. Transform the following into **standard form**:

$$y = \frac{3}{5}x - 4$$

3. Write the line with the following conditions into **slope-intercept form**: passes through $P(-2, -3)$ and has slope of $\frac{1}{4}$.

4. In **slope-intercept form**, write the equation of the line that passes through the points $(-2, 8)$ and $(1, 2)$.

Systems of Equations

I. Solve each system by **elimination**. Express your solution as an ordered pair [i.e. (-3, 6)]

1. $\begin{cases} x - 3y = 2 \\ x + 4y = 16 \end{cases}$

2. $\begin{cases} 3x + 4y = -25 \\ 2x - 3y = 6 \end{cases}$

II. Solve each system by **substitution**. Express your solution as an ordered pair.

3. $\begin{cases} 2a + b = 4 \\ b = 1 - a \end{cases}$

4. $\begin{cases} x + 3y = 2 \\ 2x + 3y = 7 \end{cases}$

Set up a system of equations and solve using any method.

5. The length of a rectangle is 5 cm less than three times its width. If the perimeter is 70cm, find the dimensions.



FACTORING POLYNOMIALS

Methods for factoring:

- GCF – *greatest common factor*
- DOTS – difference of two squares
- Factoring when a = 1
- Factoring when a >
- Grouping

Factor completely. Check by multiplying.

1. $42x^3 + 68x^2 + 16x$

2. $60y^3 - 18y^2 - 6y$

3. $12x^5 - 20x^4 + 3x^3$

4. $16a^4 - 144a^2$

5. $4n^5 - 100n$

6. $28w^7 - 102w^5$

7. $6a(a + 2) + 4(a + 2)$

8. $8(m - 3) - 5m(3 - m)$

9. $64 - 64m^2 + m^4 - m^6$

Simplifying Square Roots

For these problems, you should be able to: simplify irrational square roots.

Find each square root. Use simplest radical form for non-perfect squares. NO DECIMAL ANSWERS ALLOWED.

1. $\sqrt{441}$
2. $\sqrt{63}$
3. $5\sqrt{175}$

Multiplying and Dividing Radicals

Rule: When multiplying radicals, multiply the numbers on the **OUTSIDE** together, then multiply the numbers on the **INSIDE** of the radical together and simplify if possible.

Multiply.

4. $\sqrt{3} \cdot 4\sqrt{3}$
5. $-\sqrt{3} \cdot 2\sqrt{4}$
6. $\sqrt{\frac{7}{5}} \cdot \sqrt{\frac{45}{14}}$

Combining Radicals

Combine.

7. $9\sqrt{3} - 5\sqrt{3}$
8. $3\sqrt{54} + 2\sqrt{6}$

Solving Quadratic Equations by Factoring

Zero Product Property: for any real numbers *a* and *b*, if *ab* = 0, then either *a* = 0, *b* = 0, or both *a* and *b* equal 0.

Solve each quadratic equation.

1. $(6h-5)(6h+5)=0$

2. $7w(4w+3)=0$

3. $a^2+7a+6=0$

4. $q^2-21q=-20$

5. $c^2=9$

6. $e^2-49=0$

7. $y^2-7y-18=0$

8. $2n^2=10+n$

9. $6-23z-4z^2=0$