

# Monroe Township High School

Monroe Township, New Jersey

## HONORS GEOMETRY SUMMER PREPARATION PACKET 2026-2027

Honors Geometry is a fast-paced, rigorous course that will provide you with the fundamental tools of geometric understanding that will support you in all future advanced mathematics courses.

Since you will be taking Honors Geometry after successful completion of Algebra I, the ***Honors Geometry Preparation Packet*** contains review material of the algebraic concepts, skills, and procedures that should be mastered BEFORE entering Honors Geometry in the fall. **This practice problem packet is the only formal review of the concepts, procedures, and skills that you will have before beginning your Honors Geometry course.** Your teacher will expect you to have mastered all topics included here.

This collection of problems will identify those concepts that you have mastered as well as those you will need to practice and review. You are expected to seek extra help immediately on those concepts with which you have not demonstrated proficiency.

\*\*\* ALL WORK MUST BE SHOWN THROUGHOUT THE PACKET \*\*\*

**OPERATIONS ON NUMBERS AND EXPRESSIONS**

**Simplify each expression. Leave answers in simplified radical form.**

1.  $\sqrt{325}$

ANSWER: \_\_\_\_\_

2.  $\sqrt{3} + \sqrt{12} + \sqrt{20} + \sqrt{80}$

ANSWER: \_\_\_\_\_

3.  $2\sqrt{3}(4 + \sqrt{3})$

ANSWER: \_\_\_\_\_

4.  $\frac{2}{\sqrt{32}}$

ANSWER: \_\_\_\_\_

5.  $(3\sqrt{2})^2 + (2\sqrt{5})^2$

ANSWER: \_\_\_\_\_

**Simplify each expression. All answers should contain positive exponents.**

6.  $x^3x^6$

ANSWER: \_\_\_\_\_

7.  $(-5x^2y^{-3})^{-2}$

ANSWER: \_\_\_\_\_

8.  $\frac{6x^5y^2z^3}{4x^8yz^3}$

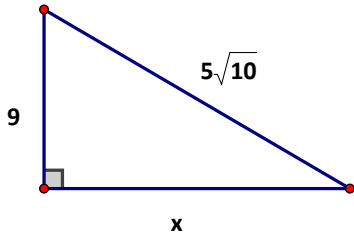
ANSWER: \_\_\_\_\_

9. Find the circumference of a circle with  $A = 36 \text{ cm}^2$ .  
*Round to the nearest tenths if necessary.*

CIRCUMFERENCE: \_\_\_\_\_

10. Use the Pythagorean Theorem to determine the length of the missing side of the right triangle.

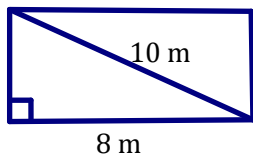
$x =$  \_\_\_\_\_



11. Find the perimeter and area of the given rectangle.  
*Round to the nearest tenths if necessary.*

PERIMETER: \_\_\_\_\_

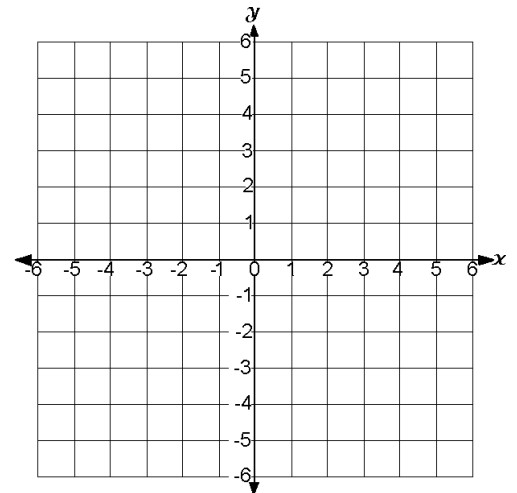
AREA: \_\_\_\_\_



12. **Graph** Quadrilateral  $FGHJ$  that has vertices  $F(-4,-1)$ ,  $G(-2,-5)$ ,  $H(4,-2)$ , and  $J(2,2)$ .

13. Find the **slope** for each of the following sides:  $\overline{FJ}$ ,  $\overline{JH}$ ,  $\overline{GH}$ .

14. Identify which sides, if any, are parallel, perpendicular, or neither.



15. Find the **lengths (distance)** of the following sides:  $\overline{FJ}$ ,  $\overline{JH}$ .

## LINEAR RELATIONSHIPS

16. Solve the equation:  $\frac{1}{3}(27x+18) = 12 + 6(x-4)$

x = \_\_\_\_\_

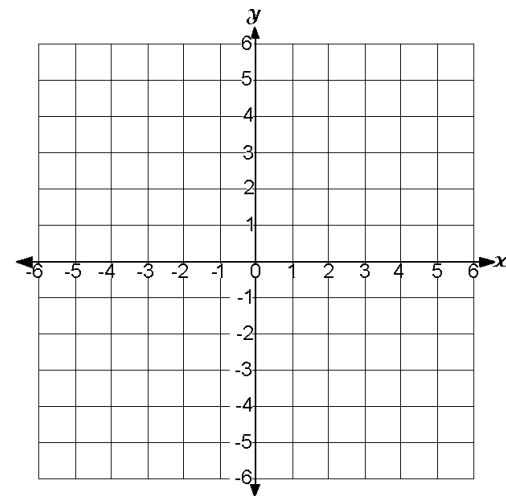
17. The area of a triangle is  $A = \frac{1}{2}bh$ . Solve the area formula for **b**.

ANSWER: \_\_\_\_\_

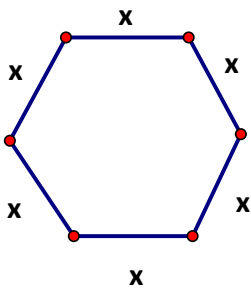
18. Graph using the x- and y-intercepts for the equation  $3x - 4y = 9$

X-Intercept: \_\_\_\_\_

Y-Intercept: \_\_\_\_\_



19. Write an equation for the **perimeter** of the regular hexagon at the right.  
Does your equation model "direct variation"?



PERIMETER EQUATION: \_\_\_\_\_  
DIRECT VARIATION? (Yes or No)

For # 20-21, use the given information to write an equation in point-slope form. Then, rewrite the equation into slope-intercept form and then standard form.

20. Write the equation of the line that passes through (3, -9) and is **parallel** to  $y = -\frac{2}{3}x + 2$

Point-Slope form: \_\_\_\_\_

Slope-Intercept form: \_\_\_\_\_

Standard form: \_\_\_\_\_

21. Write the equation of the line that passes through (-4, 7) and is **perpendicular** to the line formed by the points (3, -6) and (11, -2)

Point-Slope form: \_\_\_\_\_

Slope-Intercept form: \_\_\_\_\_

Standard form: \_\_\_\_\_

22. Solve the inequality:  $|2x - 5| \leq 10$

ANSWER: \_\_\_\_\_

23. Solve:  $5 < 4x - 11 < 13$

ANSWER: \_\_\_\_\_

24. Solve the system by substitution. Check your solution!

ANSWER: \_\_\_\_\_

$$8x + 4y = -4$$

$$y = 2x + 3$$

25. Solve the system by elimination. Check your solution!

ANSWER: \_\_\_\_\_

$$2y = 7 - 5x$$

$$4x - 16 = y$$

26. The total cost of 10 gallons of regular gasoline and 15 gallons of premium gasoline is \$32.75. Premium gasoline costs \$0.20 more per gallon than regular. What is the cost per gallon of each type of gasoline?  
*Be sure to define your variables!*

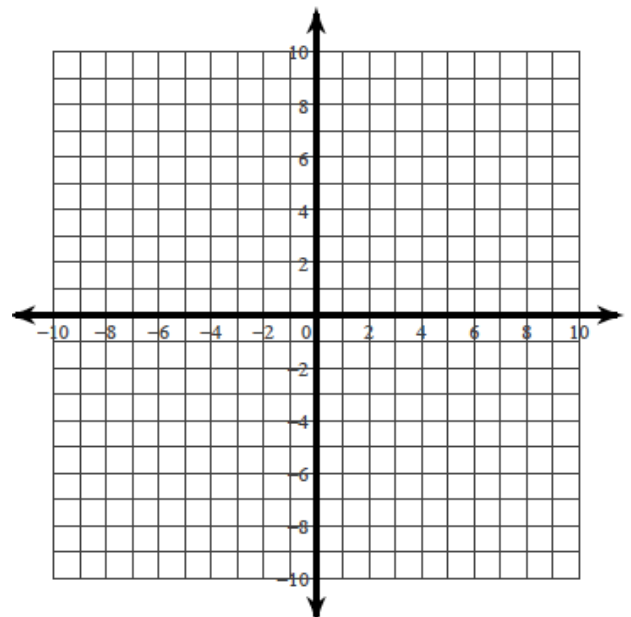
ANSWER: \_\_\_\_\_

27. What is the **AREA** of the region described by the system

$$x \leq 3$$

of linear inequalities:  $y \leq 1$  ?

$$x + y \geq 0$$

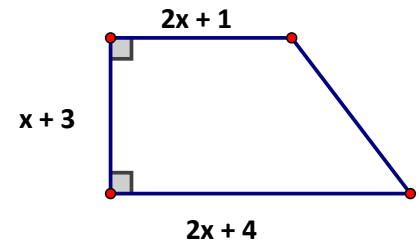


## NON-LINEAR RELATIONSHIPS

28. Solve the proportion:  $\frac{2\sqrt{3}}{x} = \frac{x}{6\sqrt{3}}$

29. Write a trinomial to represent the **AREA** of the trapezoid represented.

Recall that the area of a trapezoid is  $A = \frac{1}{2}h(b_1 + b_2)$ .



**Multiply.**

30.  $(3x - 4)^2$

31.  $(x^2 + 6x - 8)(x - 6)$

**Factor each expression.**

32.  $x^2 + 10x - 24$

33.  $-12x^2 - 36x - 27$

34.  $64x^2 - 121$

**Solve each equation.**

35.  $x^2 + 42 - 6x = 7x$

36.  $6x^2 - 12x = 0$

37.  $6x^3 - 4x^2 - 72x = 2x^2$