Monroe Township High School

Monroe Township, New Jersey

Honors Geometry
SUMMER PREPARATION PACKET 2025-2026

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.

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. $\dfrac{2}{\sqrt{32}}$ 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: _____

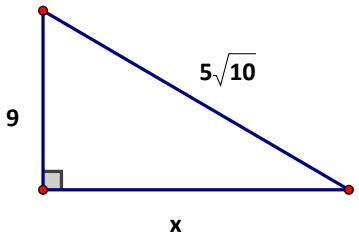
8. $\dfrac{6x^5y^2z^3}{4x^8yz^3}$ ANSWER: _____

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.

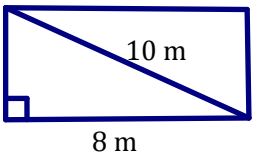
x = _____



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

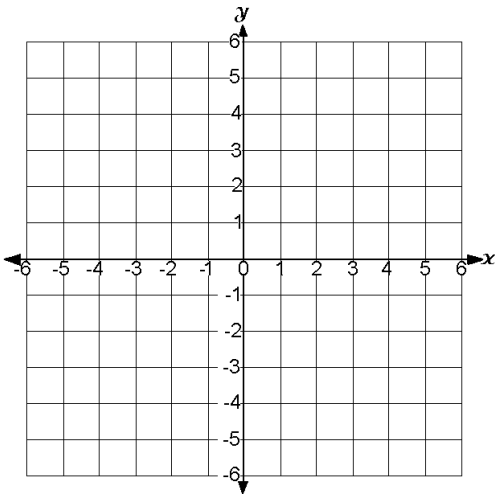
PERIMETER: _____

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

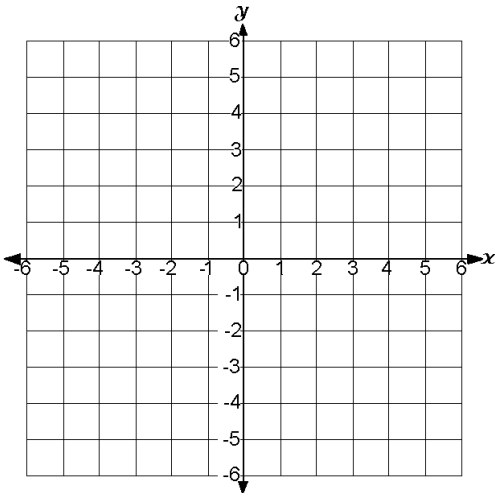
16. Solve the equation: $\frac{1}{3}(27x+18)=12+6(x-4)$ x = _____

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

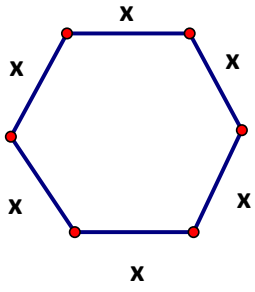
18. Graph using the x- and y-intercepts for the equation $3x-4y=9$

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: _____

$$2y = 7 - 5x$$
$$4x - 16 = y$$

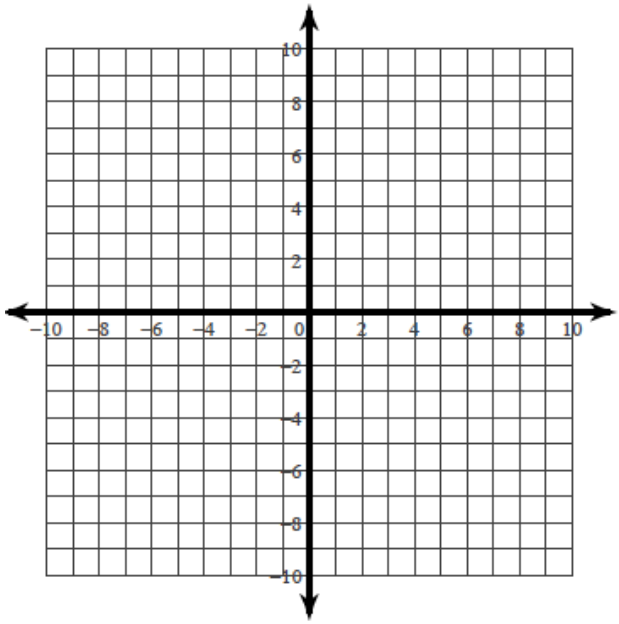
26. The total cost of 10 gallons of regular gasoline and 15 gallons of premium gasoline is $32.75. Premium gasoline costs $0.20 more per gallon than regular. What is the cost per gallon of each type of gasoline? *Be sure to define your variables!*

ANSWER: _____

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

$$x \le 3$$
$$y \le 1$$
$$x + y \ge 0$$

?

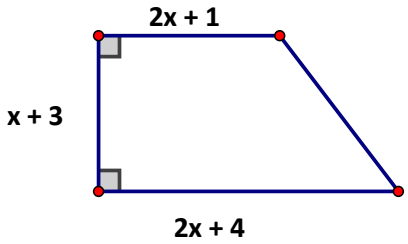


NON-LINEAR RELATIONSHIPS

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