

2023-24 GEOMETRY SUMMER PACKET

You made it to Geometry!

The topics in Geometry can be abstract and majority of them require you to have a very strong foundation skills in Algebra, logical and good abstract problem-solving skills to solve practical applications/real world problems. Mathematics is a series of building blocks. To be proficient in Geometry, students must have sufficient Algebra 1 skills and other Geometry skills they should have learned in middle school mathematics.

This packet covers most necessary Algebra topics and other fundamental concepts in Geometry. If you see any problems that you have not learned how to solve or you forgot, don't be discourage! Search on YouTube or Khan academy, or simply ask friends or adults for help!

This packet must be completed by the first day of school.

Start a few every day now. Before school starts, review the entire packet to refresh your knowledge. If you have extra time, always learn more/deeper rather than learn less and struggle. Please do not use a calculator unless indicated.

You will have a quiz during the first week of school. It will contain questions that are very similar this packet. All answers must be justified by showing all work. No work is UNACCEPTABLE. Every problem without work will award "0" credit. NO WORK = NO CREDITS

I can't wait to see you in class next year!

Without the skills included in this packet, you will struggle throughout the year in Geometry!

Parent Signature _____ Date: _____

Student Signature _____ Date: _____

Prerequisite Skills

Directions: Solve each problem in each section. Show all work where necessary.

Part I. Combining Like Terms Simplify:

1. $4x + 3y - 2x + 7y + 5$

2. $6x + 7x^2 - 4x + x^2 + 7x$

3. $5ab - 3ab + ab$

Part II. Solve for the variable. Show ALL work.

4. $6x + 3x = 90$

10. $13a - 1 = 90$

5. $3x + 18 + 5x = 180$

11. $2(12b + 7) + 9b + 1 = 180$

6. $180(n - 2) = 720$

12. $3x + 5 = 2x + 8$

7. $1 - x = 4x + 17$

13. $\frac{1}{2}(4x - 8) + 3x + 6 = 90$

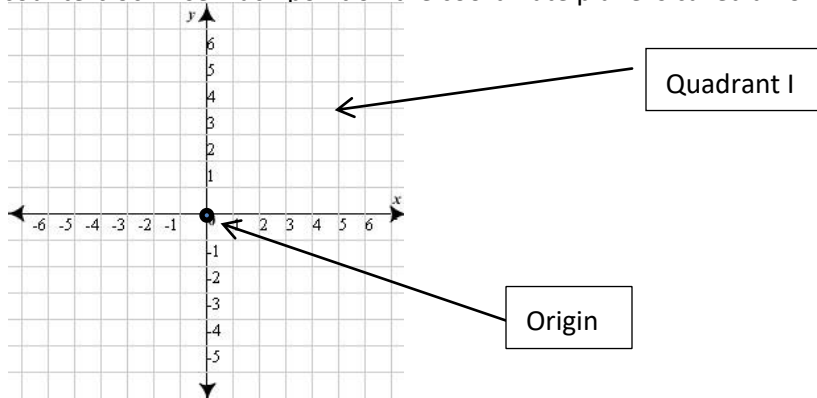
8. $7n + 8 + 4n - 3 = 6n$

14. $-2y + \frac{3}{2} = 8$

9. $6x + 5 = 7x - 2$

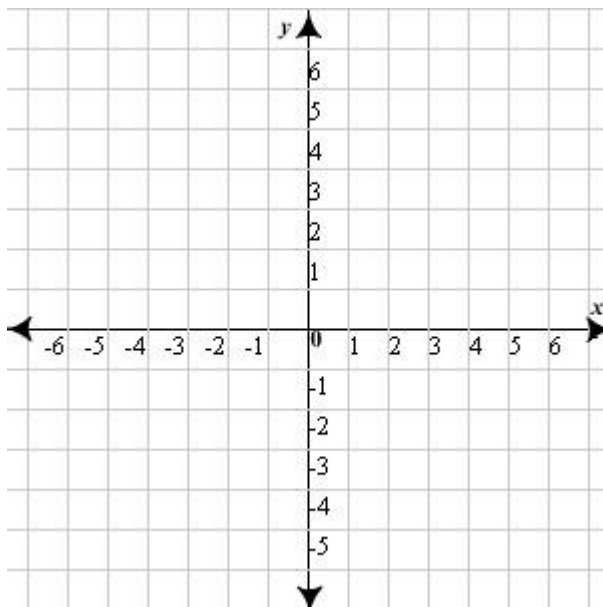
Part III. The Coordinate Plane

The coordinate plane is formed by intersecting a horizontal number line (the x-axis) with a vertical number line (the y-axis) at the point (0,0) called the origin. The four parts created by these intersecting lines are called quadrants and are numbered using Roman Numerals going counterclockwise. Each point on the coordinate plane is called an ordered pair (x, y).



15. Plot the following points on the coordinate plane. Then connect the points and name the shape that is formed.

A (5, 2), B (3, -5), and C (-6, 4)



Write down the formula to find the slope (m) of a line that contains the points (x_1, y_1) and (x_2, y_2) :

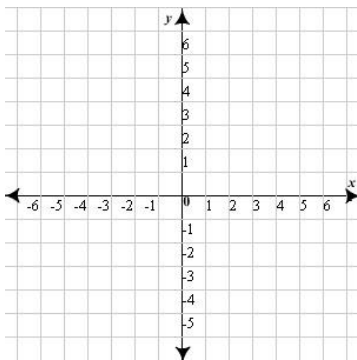
Slope is known as rise over run.

A vertical line has an undefined slope or no slope. **Why?**

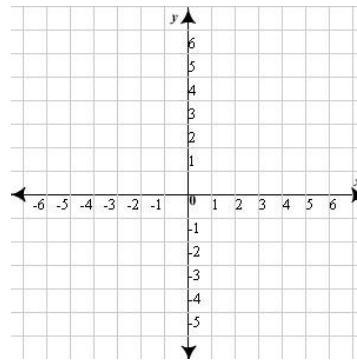
A horizontal line has a slope of 0. **Why?**

Directions: Plot the points on the coordinate plane and connect them with a line. Then find the slope of the line connecting the following two points by doing rise over run and then confirm your answer by using the slope formula. Show ALL work.

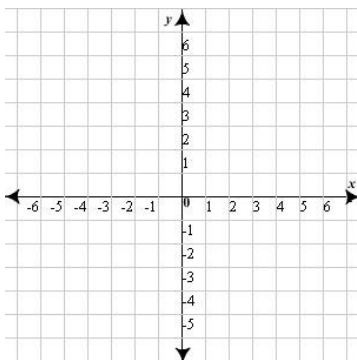
16. $(1, 2)$ and $(6, 6)$



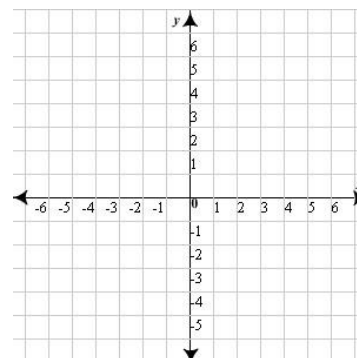
18. $(5, 6)$ and $(5, -4)$



17. $(-3, 6)$ and $(5, -4)$



19. $(6, -3)$ and $(-2, -3)$



Part V. Perimeter and Area

Perimeter is the distance around a geometric figure. Write down the formula for finding the perimeter of a rectangle:

Since a square has 4 equal sides, its perimeter is 4 times the length of a side: $P = 4s$

Area is the number of square units needed to cover a surface. Write down the formula used to find the area of a rectangle?

To find the area of a square, find the square of the length of one side: $A = s^2$.

For each problem, draw the figure and calculate the perimeter and area of each figure. Remember to include the UNITS for each answer.

20. A rectangle has a length of 10 inches and a width of 4 inches.

21. A rectangle has a length of 9 feet and a width of 6 feet.

22. A square has a side length of 6.25 centimeters.

23. A square has a side length of 9 meters.

Part VI. Circumference and Area

****Calculator May be Used**

Circumference is the distance around a circle. In a circle, r is the radius and d is the diameter of the circle (twice the radius). Write down the TWO formulas used to find the circumference of a circle:

Write down the formula for finding the **Area** of a circle:

For each problem, draw a circle with the given situation. Then find the **circumference** and **area** of each circle. Show all work. **Round your answers to the nearest hundredth.** Remember to include the UNITS in your answer.

24. The radius is 4.5 feet.

25. The diameter is 15 inches.

26. The radius is 3 meters.

27. The diameter is 24.5 centimeters.

Part VII. Volume

Volume is the measure of space occupied by a solid. Volume is measured in cubic units. Write down the formula to find the volume of a rectangular prism:

For each problem, find the volume. Remember to include the units.

28. An aquarium is 8 feet long, 5 feet wide, and 3.4 feet deep. What is the volume of the tank?

29. A cube measures 4 meters on each side. Find its volume.

Part VIII. Distance and Midpoint Formula ****Calculator May be Used**

Use the distance formula to calculate the length of a line segment and use the midpoint formula to find the center of the line segment.

Write down the distance formula:

Write down the midpoint formula:

30. Find the midpoint and distance of the line segment AB connecting the two points:
A(-4, 5) and B(0, 8).

31. Find the midpoint and distance of the line segment AB connecting the two points:
A(2, 7) and B(-4, -6).

32. Find the midpoint and distance of the line segment AB connecting the two points:
A(-2.5, 4) and B(5.5, 6).

Part IX. Getting Ready for Coordinate Geometry ****Calculator May be Used**

Task: Find the perimeter of pentagon ABCDE with A(0, 4), B(4, 0), C(3, -4), D(-3, -4) and E(-3, 1).

33. Plot the points on the coordinate plane above and connect the points in alphabetical order.

34. Use the distance formula to find the length of segment AB.

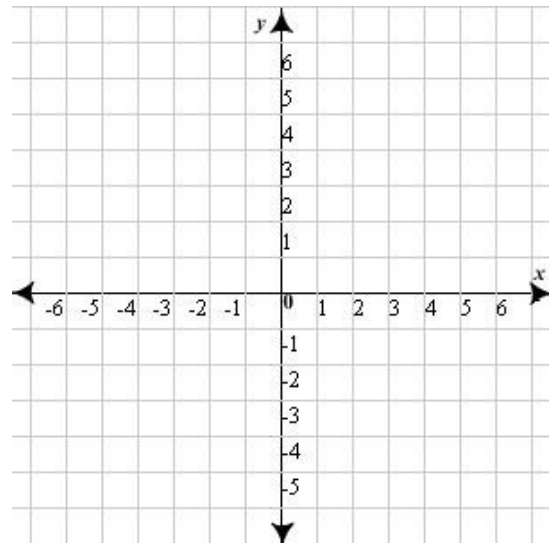
35. Use the distance formula to find the length of segment BC.

36. Use the distance formula to find the length of segment CD.

37. Use the distance formula to find the length of segment DE.

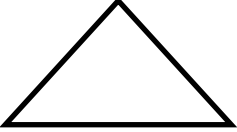
38. Use the distance formula to find the length of segment AE.

39. Find the perimeter of pentagon ABCDE by adding your answers from problems 34-38. Round to the nearest whole number.



Part X. Names of Polygons

40. Complete the following chart:

Name of Polygon	Number of Sides	Drawing
<i>Example:</i> Triangle	3	
	4	
	5	
	6	
	7	
	8	

Math in the Real World: Interview

Directions: Interview an adult about how they used mathematics this summer. Tell them, "Part of my math class is to conduct an interview. Can you please tell me 5 specific ways that you used math this summer?" Then write them down below. Number each one and write neatly.

Family Math Tree

Directions: Create a Family Tree. Ask each one of your family members how they feel about mathematics. Draw a happy face 😊 if they like math and a sad face ☹️ if they don't like math. If they don't feel one way or the other, indicate it in your family tree. If someone in your family is too young to know whether like math or not (a baby for instance), then still include them in your family tree but write "TBD" which stands for "To Be Determined".