This document is intended to help students remember topics learned in Algebra I and Geometry when they haven't recently worked on these topics. It is not intended to reteach, simply to remind. Sample problems and important information, how to search for the topic, and a link to a video about it have been provided.

Evaluate the Expression

This may have been called "simplify" or you used order of operations after you substitute values. There are many math symbols you need to remember:

- $\sqrt{number}$ or $\sqrt[3]{number}$
- $\frac{number}{number}$
- $|number|$

Example:

Evaluate the expression when $a = -2 \; and \; b = 5$

$$\frac{-a + \sqrt{-4 + b}}{a^2 + |a - b|}$$

You could search "Evaluate the Expression" for assistance with this topic.

This Khan Academy video will give the basic idea.

Equations and Inequalities

You will solve for a variable. Usually this involves completing inverse operations on both sides of the equation (=) or inequality ($<, >, \leq, \geq$). There is a special rule when multiplying or dividing by a negative in an inequality. The distributive property and combine like terms are used in these problems. There are special cases when there is no solution or all real numbers will work.

Example:

$\frac{2}{3}(6x - 4) = 8x + 9 - 14x$ $\qquad\qquad$ $14 \leq -2x - 3(2x + 5)$

You could search "solving multistep equations" or "solving multistep inequalities" for assistance with this topic.

This video will remind you about solving equations.

This video will remind you about solving inequalities.

Exponent Rules

You may have been taught to write out what the exponent means and then combine or cancel or you were taught rules like

- when you multiply with the same base you add the exponents
- when you divide with the same base you subtract the exponents
- negative exponents "move" from the bottom to the top or the top to the bottom of a fraction
- exponents outside parentheses get multiplied by exponents inside parentheses

Example:
Simplify: $\frac{4x^7}{12x^3}$
Simplify: $(5xy^3)(-2x^5y^4)$
Simplify: $(3x^4)^3$
Simplify: $\frac{3x^{-2}}{6y^{-9}}$

You can search "Laws of Exponents" for assistance with this topic.
This video will remind you about the laws of exponents.

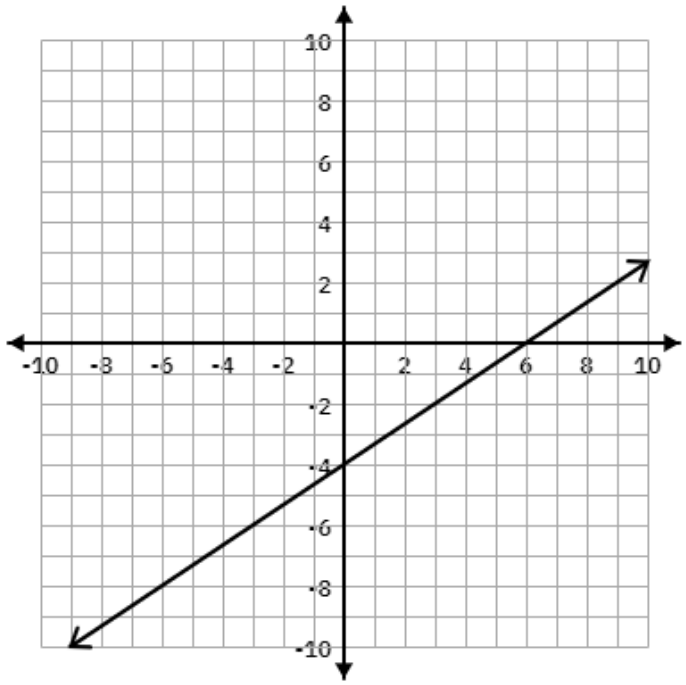
Polynomials
Here you combine like terms, multiply, and factor. When multiplying every term in the first parentheses multiplies by every term in the second parentheses and then like terms get combined without changing exponents. Factoring is the opposite, you are finding out what can be multiplied to create the given problem. Sometimes you have to factor in order to simplify fractions or combine like terms.

Example:
Simplify or find the product of: $(x+3)(x-2)$
Simplify or find the product of: $(x^2-2x+3)(x-2)$
Factor completely: x^2+x-6
Factor completely: $3x^2+3x-18$
Simplify: $\frac{3x+9}{x^2+x-6}$
Simplify: $(x+3)(x-2)+(x^2-2x+3)$

You can search "Polynomial Operations" for assistance with this topic.
This video will remind you about polynomial operations.

Linear Equations
These are lines and they can be graphed, have a table, have an equation, or a word problem to explain. They involve slope (often remembered as rise over run) and y-intercept (point on the y axis where x=0). You can be asked to find the slope, graph the line, write the equation, make a table.

Example:
What is the slope of the line $2x+3y=9$? Or Graph the line $2x+3y=9$?
What is the slope of the line that passes through the two points (-2, 3) and (7, -9)? Or What is the equation of the line that passes through the two points (-2, 3) and (7, -9)?
What is the slope of the line shown on the graph? Or What is the equation of the line on the graph?



A parking garage charges $3.00 to enter the garage and $1.00 for every hour. Write an equation where T is the total charge to park and h is the number of hours in the garage.

You can search “Linear Equations” for assistance with this topic.
This video will remind you about Linear Equations.

Systems of Equations and Inequalities
Systems are also called Simultaneous equation or inequalities. This is graphing 2 or more equations or inequalities at the same time. They could be any function (lines, parabolas, circles, etc.). When the graphs overlap or cross you’ve found a solution. There are special cases where the graphs do not overlap or they overlap on every point.

Example:
Solve the system:
$3x - 2y = 6$
$x + y = -8$

Solve the system:
$2x + 3y \leq -9$
$2x - 3y > -3$

You can search “Systems of Equations” or “Simultaneous Equations” or “Systems of Inequalities” for assistance with this topic.
This video will remind you about Systems of equations.
This video will remind you about Systems of inequalities.

Quadratics

These are equations with a second power and graph as a parabola. You can find solutions or roots or zeros by graphing or factoring and using the zero product property or using the quadratic formula.

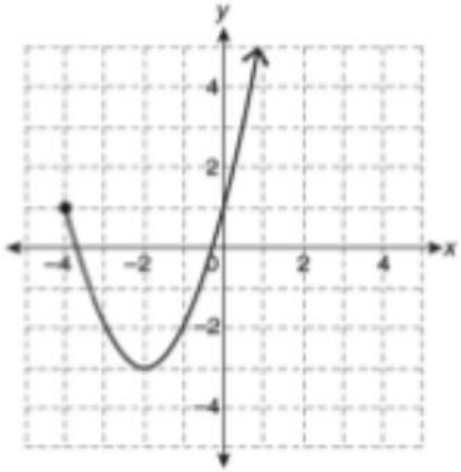
Example:
Solve:
$3x^2 = 10x + 8$

You can search "Solving quadratic equations" for assistance with this topic.
This video will remind you about solving quadratics.

Domain and Range

The domain is all the values of x that will work in a function and the range is all the values of y that result from an x value being substituted in a function. Values of a domain can be evaluated in a function to find the values of the range. Domain and range can be found from a function written like f(x) = or a graph.

Example:



What is the domain?
What is the range?

You can search "Domain and Range" for assistance with this topic.
This video will remind you about Domain and Range.

Distance and Midpoint Formulas

These formulas are not provided. The distance formula can be figured out from the Pythagorean Theorem or memorized. The midpoint formula can be figured out with the concept of average or memorized.

Example:

A segment has endpoints (-3, 5) and (2, -10). Find the length of the segment and the midpoint of the segment.
You can search “Distance Formula” and “Midpoint Formula” for assistance with this topic.
This video will remind you about distance formula.
This video will remind you about midpoint formula.

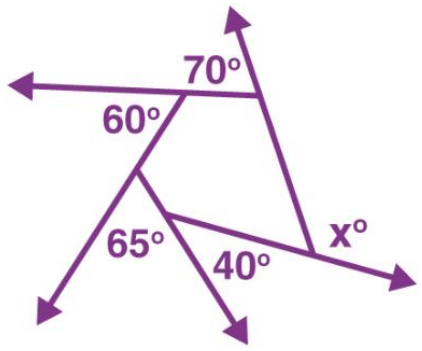
Logic
When a statement is given you can write the converse, inverse, and contrapositive. There are logically equivalent statements and laws of logic that can be applied to determine if something is logically equivalent.

Example:
If angle A measures 35 degrees, then angle A is an acute angle.
Write a logically equivalent statement.

You can search “logic in geometry” for assistance with this topic.
This video will remind you about logic.

Polygons
The sum of the measures of the interior angles of a polygon is related to the number of sides of the polygon. The exterior and interior angles of a polygon form a straight line. Polygons have names based on the number of sides. Regular polygons are such that all sides are the same length, and all angles are the same measure.

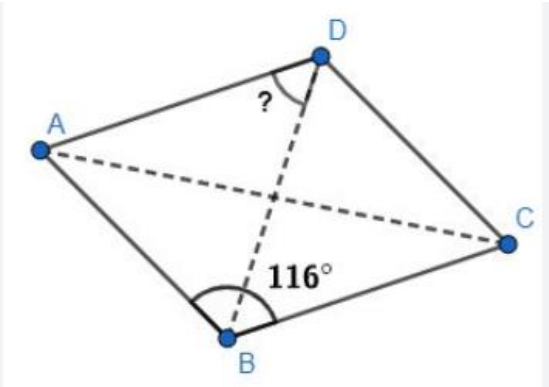
Example:
Find the measures of the missing angles.



You can search “interior and exterior angles of polygons” for assistance with this topic.
This video will remind you about polygons and their angles.

Quadrilaterals
Quadrilaterals are four sided polygons. The properties vary the more specific the shape and include side length, diagonal relationships, and angle measures. The quadrilaterals explored in the US include Parallelogram, Rectangle, Square, Rhombus, Trapezoid, Isosceles Trapezoid.

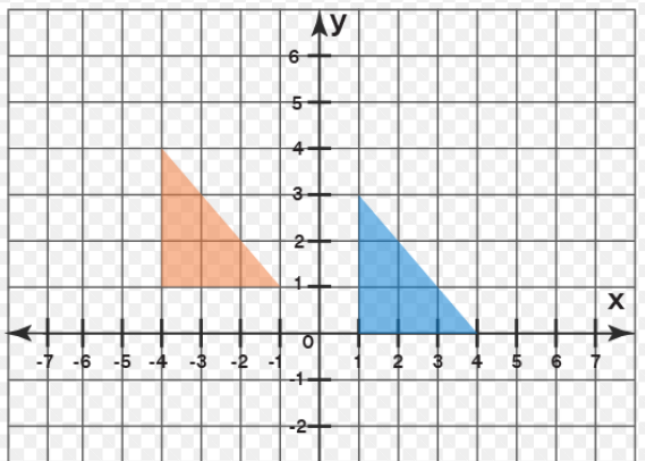
Example:
ABCD is a rhombus. What is the value of the angle marked with the question mark?



You can search “Quadrilateral properties” for assistance with this topic.
This video will remind you about Quadrilaterals.

Transformations
Transformations are usually represented on a coordinate plane. They include translations, reflections, rotations, and dilations.

Example:
Describe the transformation of the orange triangle to the blue triangle.

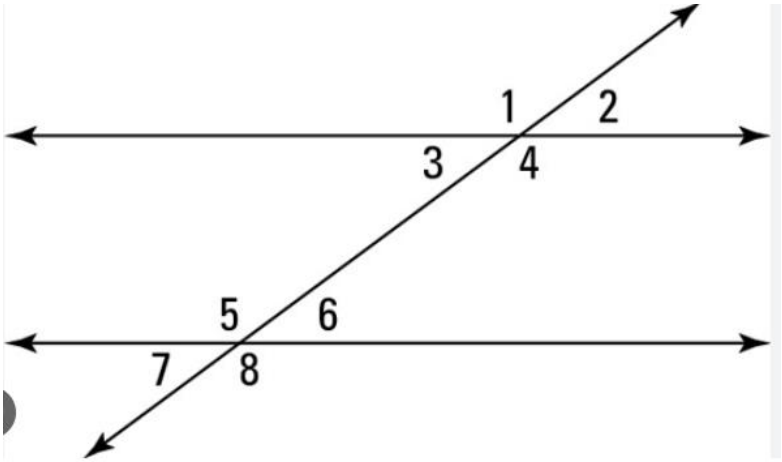


You can search “Geometric Transformations” for assistance with this topic.
This video will remind you about transformations.

Parallel Lines
Parallel lines cut by a transversal create angles which have specific relationships. Angles include vertical, linear pair, alternate interior, alternate exterior, same side interior, same side exterior, corresponding.

Example:

If the measure of angle 2 is 38 degrees, find all other angle measures that would prove the lines are parallel.

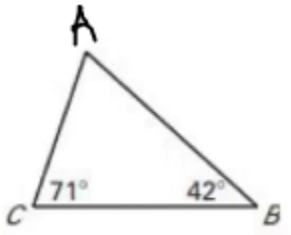


You can search “parallel lines cut by a transversal” for assistance with this topic.
This video will remind you about parallel lines and their angles.

Triangles

When given the lengths of three sides you can be asked if those sides for a triangle or if they form a right triangle. You can also determine the range of the length of the third side of a triangle given the lengths of two sides. You can also determine which angle or side must be largest or smallest given the lengths of sides or angles.

Example:
Name the shortest side in the triangle.



Do the measurements 5, 7, 12 create a triangle?

If a triangle has side lengths 3, 4, 5, is it a right triangle?

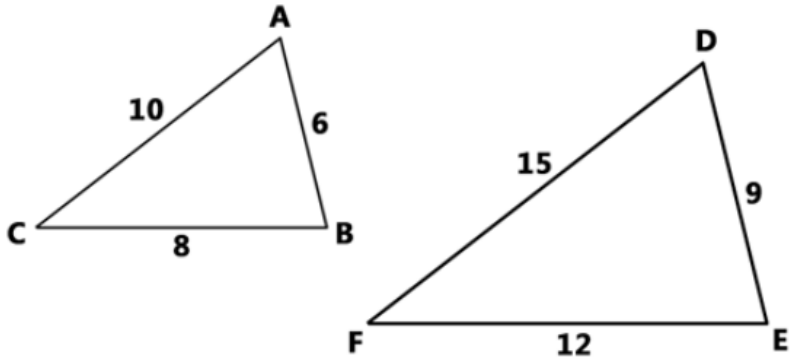
If two sides of a triangle measure 5 and 8, what are possible lengths of the third side?

You can search “triangle inequality theorem” for assistance with this topic.
This video will remind you about triangle sides and angles.

Congruent and Similar figures

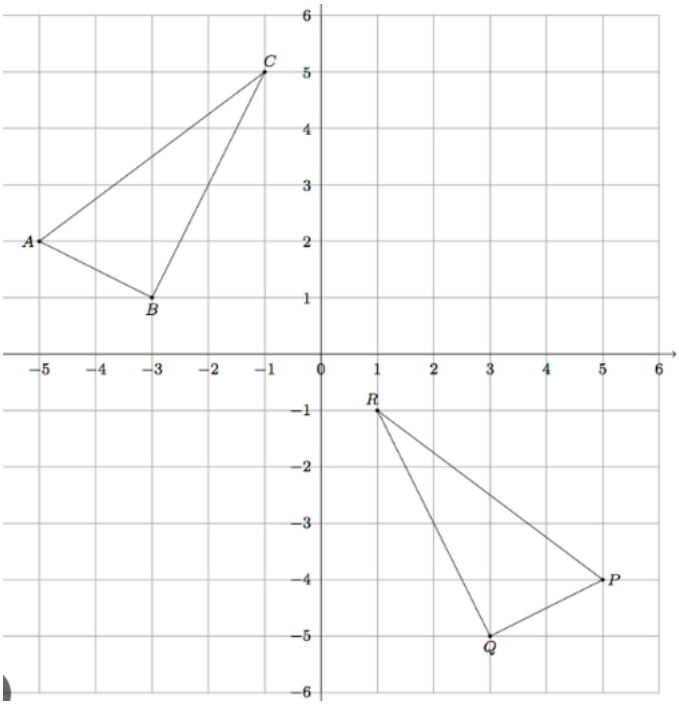
Congruent figures are the same shape and size. Similar figures have angles that are the same measure but the sides are proportional.

Example:
What proportions can be written to prove the triangles are similar?



Write the similarity statement for the triangles.

Show if the triangles are congruent or not.

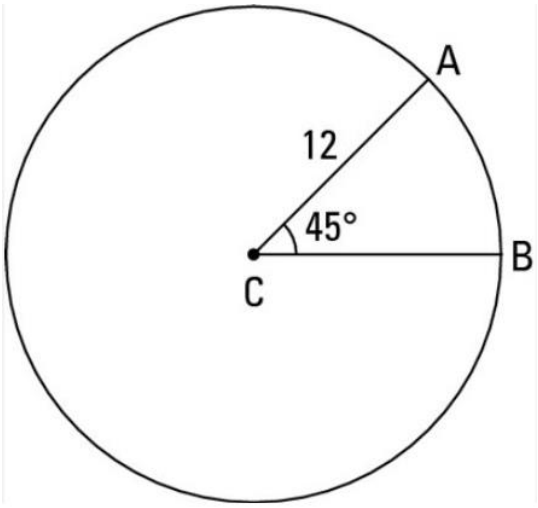


You can search “polygon congruence” and “polygon similarity” for assistance with this topic.
This video will remind you about congruence.
This video will remind you about similarity.

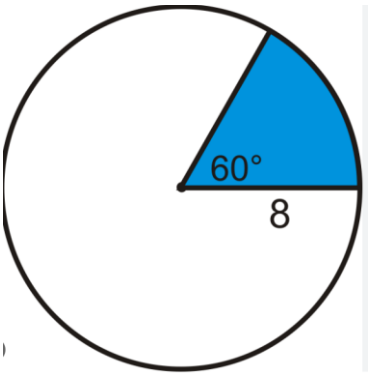
Circles

The length of an arc of a circle is a fraction of the circumference and the fraction is based on the central angle and the whole circle. The area of a sector is based on the fraction of the area of the circle.

Example:
What is the length of arc AB?



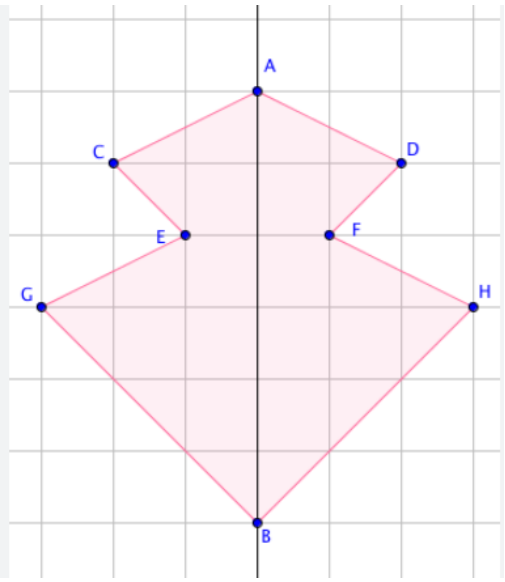
What is the area of the shaded sector?



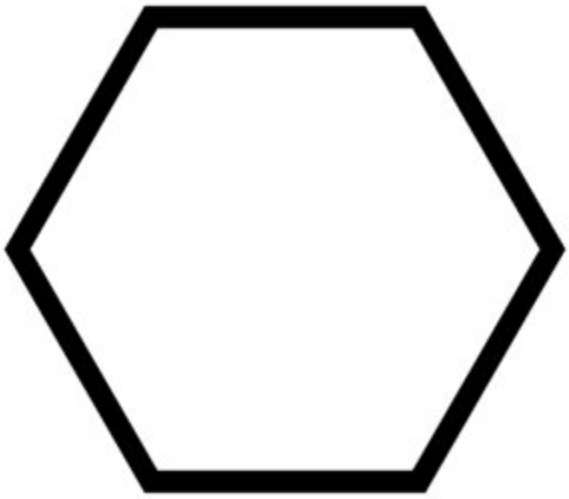
You can search “circle arc length” and “circle sector area” for assistance with this topic.
This video will remind you about circles.

Symmetry
A line of symmetry divides a shape into two equal parts. This can be shown on a picture or coordinate grid.

Example:
If line AB is a line of symmetry for the shape and the coordinates of point H are (6, 5), what are the coordinates of point C?



Draw all the lines of symmetry in the hexagon:



You can search “polygon symmetry” for assistance with this topic.
This video will remind you about symmetry.

3-D Figures

Surface area and volume of three-dimensional figures can be determined with formulas. A formula sheet is provided. Dimensions can be changed in figures which will change the surface area and volume in predictable ways.

Example:
A square based pyramid has a volume of 1,082.76 cm^3. If the height is tripled, what is the volume of the new pyramid?

You can search “surface area of 3 dimensional figures” or “volume of three dimensional figures” or “changing an attribute changing volume or surface area” for assistance with this topic.
This video will remind you about 3-D figures.