

Welcome to Jesuit High School's Math Community!

Jesuit invites middle school and high school students to join a math community where they can collaborate and develop their mathematics, problem-solving, and communication skills. The program aims to:

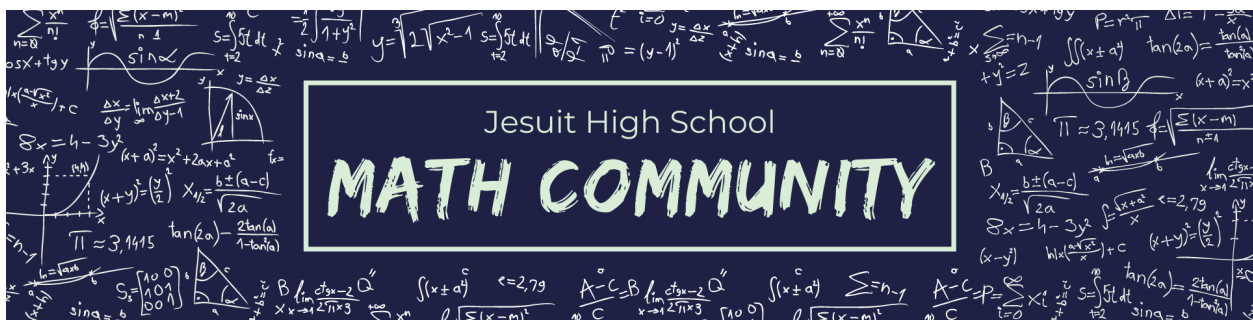
- Enhance a student's performance in their regular math class
- Provide opportunities to explore interesting topics beyond what is usually covered in a school's curriculum
- Assist students seeking to progress to a higher level of mathematics
- Support students interested in preparing for mathematics and science competitions
- Create a setting for advanced math students to explore STEM fields such as computer science and physics

Jesuit High School's Math Community courses are virtual and conducted in real time. Students participate in discussion-based lectures and collaborate to solve problems. Students are asked to participate with their video camera on during the class period.

2022 online Autumn Session courses include:

- [#097 Problem-Solving with Prealgebra: Square Roots & Geometry](#)
- [#105 Python for Beginners: Simple Games](#)
- [#106 Python: Dynamic Games](#)
- [#121 Problem Solving with Algebra: Inequalities & Quadratics](#)
- [#135 Geometry Part One](#)

Questions? Please email questions to onlinelearning@jesuitportland.org.



#097 Problem-Solving with Prealgebra: Square Roots & Geometry

9/17-12/10, no class 11/26 (12 Saturdays) 9:30 - 11 AM

\$260 (\$235 by 9/14)

Students will deepen their understanding of prealgebra by applying it to problems involving square roots and geometry. This course also offers fun puzzle-solving challenges to current algebra 1 students. Students will strengthen mathematical skills and intuition through conversation, problem-solving, and mathematical puzzles. Topics include **square roots, square roots of non-square integers, arithmetic with square roots, measuring angles, parallel lines, angles in polygons, measuring segments, perimeter, area, circles, right triangles, Pythagorean theorem, and quadrilaterals.**

Prerequisites: The course is a good choice for a student who can answer **22 or more** of the problems on [this placement quiz](#) (some questions have multiple problems). The problems below are examples of discussion topics for the course. They are not prerequisites.

Challenge 1

Which is larger, $7\sqrt{11}$ or $6\sqrt{15}$?

Challenge 2

Two lines intersect such that the measure of one of the angles formed by the lines is five times the measure of another of the angles formed by the lines. What are the measures of the angles formed by the lines?



Challenge 3

An architect draws a rectangular room to scale. The drawing is 12 cm long and 8 cm wide. The shorter dimension of the actual room is 20 feet. What is the perimeter of the actual room?

Challenge 4

The ratio of the circumferences of two circles is 3:5. What is the ratio of their areas?

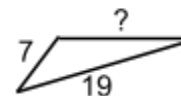
Challenge 5

What is the greatest number of points at which a circle and a hexagon can intersect?



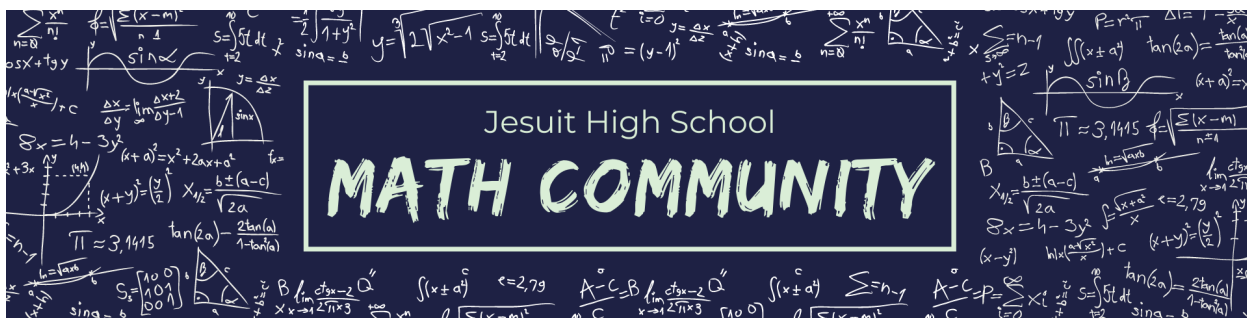
Challenge 6

How many different integers can possibly be the third side length of a triangle in which the other two sides have lengths 7 and 19?



Challenge 7

The lengths of the diagonals of a rhombus are 10 inches and 24 inches. What are the perimeter and area of the rhombus?



#105 Python for Beginners: Simple Games

9/17-12/10, no class 11/26 (12 Saturdays)

9-10:30 AM

\$275 (\$250 by 9/14)

This course is for students new to programming or who have not programmed with Python. Through writing code for simple games, students will acquire the programming skills necessary to create programs of their own. Although this course will use the Python programming language, concepts covered in this course will form the foundation necessary to learn other programming languages.

Prerequisites: This class does not require advanced math knowledge. It will require logic skills at a level similar to the level required of a student currently studying algebra 1 or higher.

Requirements: Students will receive instructions for downloading and installing Python on Microsoft Windows, Mac OS, or Ubuntu. Students will write code and view the instructor's code during class. Each student needs either a monitor large enough to view both the Zoom meeting and their coding window, or two devices (one for Zoom and one for typing code).

Become comfortable using the following statements:

```
import
while
if
elif
break
def
del
```

Use standard library functions:

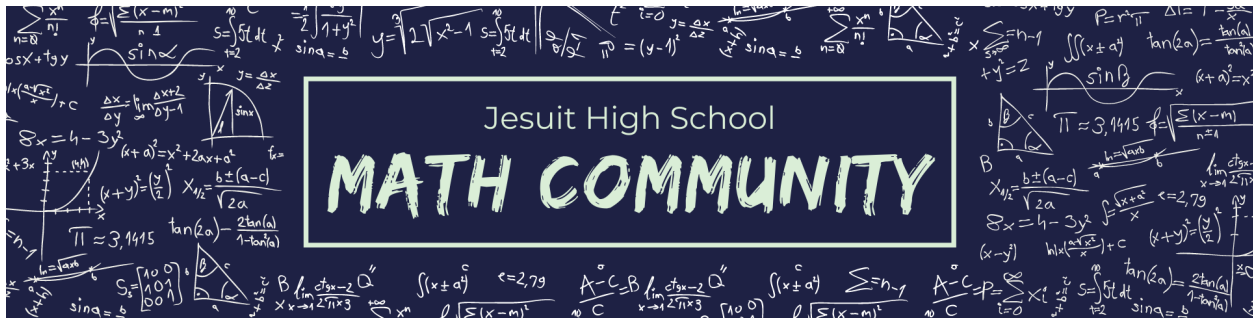
```
print()
input()
randint()
list()
range()
join()
```

Learn how to...

- Apply proper syntax
- Evaluate expressions
- Store values in variables
- Name variables
- Overwrite variables
- Define constant variables
- Import modules
- Use loops to repeat code

- Group with blocks
- Pass arguments to functions
- Incorporate comparison operators
- Define conditions
- Call functions
- Write functions
- Return values

- Distinguish between local scope and global scope
- Debug
- Create flowcharts
- Create simple ASCII art
- Access items with indexes
- Concatenate lists
- Slice lists and strings



#106 Python: Dynamic Games

9/17-12/10, no class 11/26 (12 Saturdays) 11:00 AM - 12:30 PM

\$275 (\$250 by 9/14)

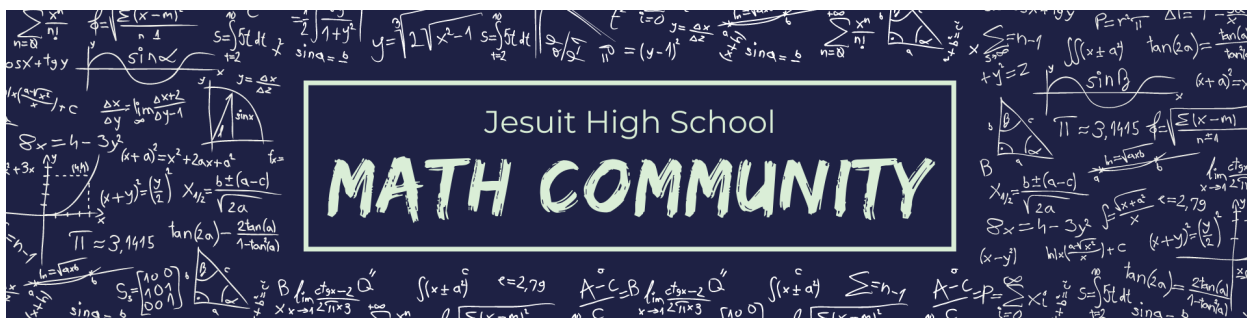
Description: This course is for students familiar with basic Python syntax who would like to expand their skills to write more complex code. Students will learn about and compare basic AI techniques, use pygame to create game graphics, animate graphics, allow the player to move objects with a keyboard, incorporate image and sound files, create scoreboards, and incorporate clocks and timers.

Prerequisites: Ability to use basic Python commands.

Requirements: Students will write code and view the instructor's code during class. Each student needs either a monitor large enough to view both the Zoom meeting and their coding window, or two devices (one for Zoom and one for typing code).

Learn how to...

- Use simple encryption
- Keep score
- Create basic AI algorithms
- Use pygame
- Use a clock to pace a program
- Program keystrokes to manipulate graphics
- Incorporate sound files
- Incorporate image files
- Create options to end or pause a game



#121 Problem Solving with Algebra: Inequalities & Quadratics

9/17-12/10, no class 11/26 (12 Saturdays) 11:15 AM - 12:45 PM

\$260 (\$235 by 9/14)

Description: By creating and solving inequalities and quadratic equations, students will expand their foundations to include skills that will be instrumental in mastering algebra. Students will discuss and build skills involving **linear inequalities, graphing inequalities, optimization, multiplying binomials, factoring quadratics, and roots of quadratics.**

Prerequisite: This class is for students with solid prealgebra skills who can successfully complete this [placement quiz](#) and solve linear equations. The problems below are examples of discussion topics. They are not prerequisites.

Challenge 1

What is the smallest positive integer that has a square root that is greater than 10?

Challenge 2

I have \$230 and I'm at a bookstore. I love books, so I want to buy as many as I can. The books I want to buy each cost \$17. At most, how many books can I buy and still have at least \$25 left for dinner?

Challenge 3

Graph the inequality $2(y + 3) \leq 4 - x$.

Challenge 4

Betty goes to the store to get flour and sugar. The amount of flour she buys, in pounds, is at least 6 pounds more than half the amount of sugar, and is no more than twice the amount of sugar. Find the least number of pounds of sugar that Betty could buy.

Challenge 5

Expand the product $(y + 4)(y + 2)$.

Challenge 6

$(x + r)(x + s) = 2 + 8x + 15$. What must rs be? Find r and s .

Challenge 7

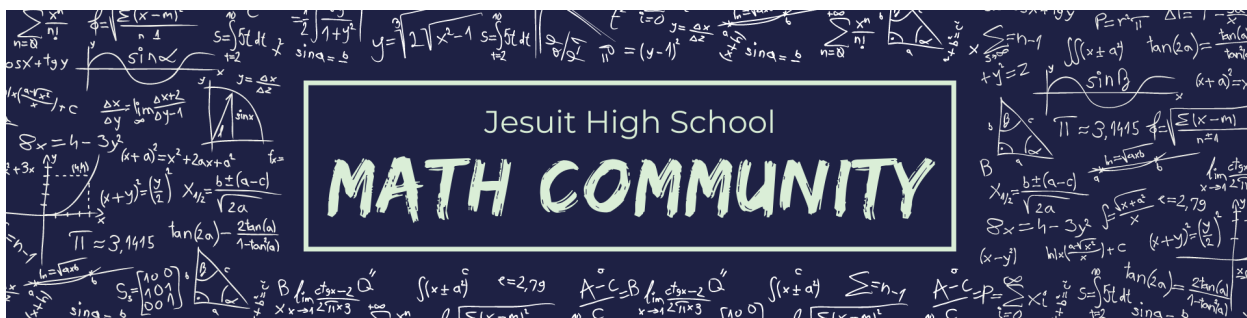
Find all values of x such that $\frac{4}{x} = \frac{x}{16}$.

Challenge 8

Factor $8x^2 - 33x + 4$.

Challenge 9

Solve for t when $72 + 6t = t^2$.



#135 Geometry Part One

9/17-12/10, no class 11/26 (12 Saturdays)

2 - 3:30 PM

\$260 (\$235 by 9/14)

Students will learn about Euclidean geometry. This is the first part of a three-part series that covers all topics included in Jesuit's Summer Session *Geometry* course and Jesuit's Geometry Challenge Exam for incoming freshmen. Topics include **essentials of geometry, reasoning and proof, parallel and perpendicular lines**, and **congruent triangles**. Students who continue with the series will study relationships within triangles, similarity, right triangles, and trigonometry in Winter Session and quadrilaterals, properties of circles, length, and area in Spring Session.

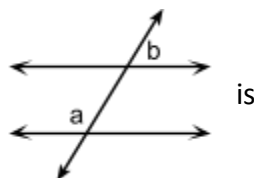
Prerequisites: This course is recommended for students who are currently studying algebra in school. Students should be comfortable manipulating variables in order to solve linear equations and inequalities, able to graph linear equations, and familiar with simple radical expressions. The problems below are examples of discussion topics. They are not prerequisites.

Challenge 1

Find a counterexample to disprove the conjecture: *If the quotient of two numbers is positive, then the two numbers must both be positive.*

Challenge 2

If the two horizontal lines are parallel, and the measure of angle a 100 degrees, what is the measure of angle b ?

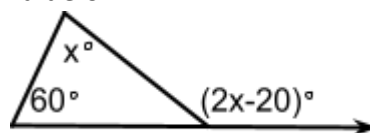


Challenge 3

Find the distance between the parallel lines $y = 2x + 3$ and $y = 2x + 8$.

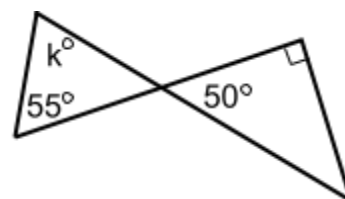
Challenge 4

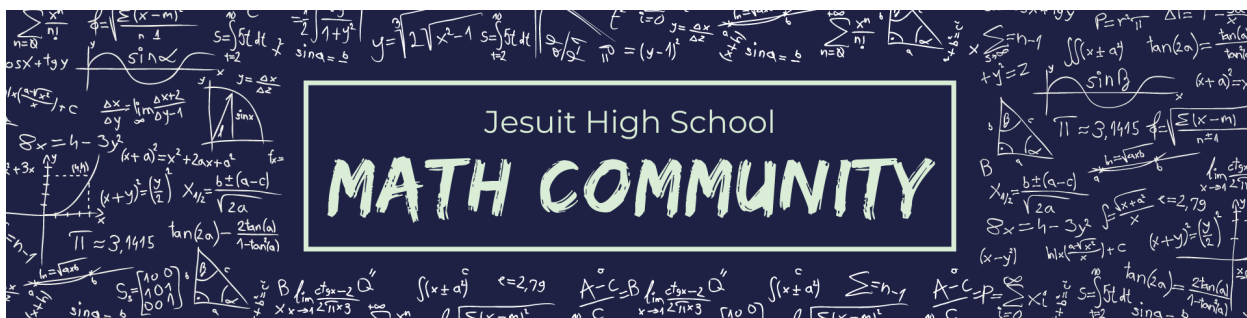
Find the value of x .



Challenge 5

Find the value of k .





Jesuit High School Math Community FAQ

Will I receive credit for Jesuit's Math Community courses?

Math Community courses that do not take place in the summer are not for credit.

How will I access my course?

Students access courses through Canvas, the classroom management software system that Jesuit uses. Students will receive an email with instructions for logging into their course through Canvas. The course's Canvas page will include a Zoom link for the course's class meetings.

What materials will I need?

Course materials will be accessed online through Canvas.

What if I have a question to ask about my class?

Before the class begins you will receive an email address to contact your instructor.

If I will be attending Jesuit High School in the fall, will I still need to take a challenge exam if I complete a course with Jesuit's Math Community?

Yes. The three-part geometry series covers the material that is included on Jesuit's Geometry Challenge Exam; however, the class does not include the in-person evaluations Jesuit uses in courses for advancement. These classes are excellent opportunities to prepare for the on-campus challenge exams.

Will Jesuit's Math Community courses affect my GPA?

No. Some Math Community courses provide grades in order to give students feedback on their performance; however, the grades will not be included on a Jesuit transcript.

Does enrollment in Jesuit's Math Community affect admissions into Jesuit High School?

No. Jesuit's Math Community is not connected to Jesuit High School's admissions process.