

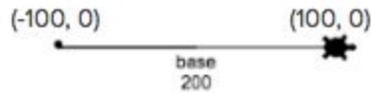
Categorizing Triangles with a Static Base Value

Corresponding Material

Lesson 2: Categorizing Triangles with a Static Base Value

Discussion

In our computer program, we are using a base of length 200 with the following coordinates:



We must determine the type of triangle being drawn depending on the placement of the third point of the triangle. Remember, y values will only be positive.

Mathematical equations can be used to solve for side lengths or angles in a triangle. The following equations can be helpful when categorizing triangles:

Pythagorean Theorem (used only with right triangles):

$$\text{hypotenuse}^2 = \text{leg}^2 + \text{leg}^2$$

Trigonometry Equations:

$$\sin(\theta) = \frac{\text{opposite}}{\text{hypotenuse}}$$

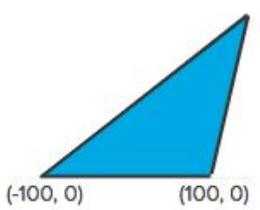
$$\cos(\theta) = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan(\theta) = \frac{\text{opposite}}{\text{adjacent}}$$

Exercise

Fill in the conditions necessary to create the following triangle types. Then translate the conditions into text that will be understood in a Python program. Use these conditions in your if/else statement inside the `determine_triangle_type` function. The first condition has been completed for you.

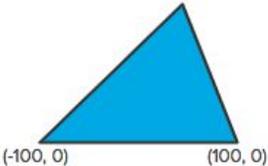
Obtuse Triangle:

Image	Sample x,y Values	Condition(s)	Python Translated Condition
	(150, 100) (-175, 75) (105, 50) (-120, 35)	x must be greater than 100 or less than -100 y doesn't matter	$x < -100$ or $x > 100$

 <p>(-100, 0) (100, 0)</p>			
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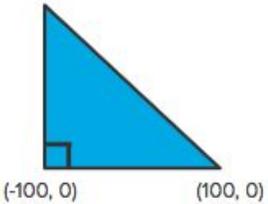
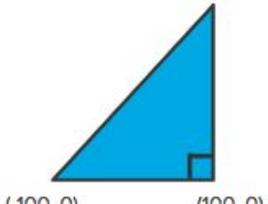
Final Python translated condition for obtuse triangles:

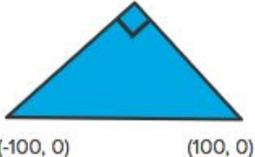
Acute Triangle:

Image	Sample x,y Values	Condition(s)	Python Translated Condition
 <p>(-100, 0) (100, 0)</p>			

Final Python translated condition for acute triangles:

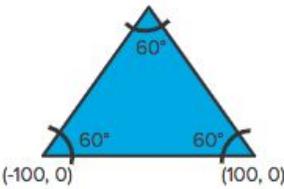
Right Triangle:

Image	Sample x,y Values	Condition(s)	Python Translated Condition
 <p>(-100, 0) (100, 0)</p>			
 <p>(-100, 0) (100, 0)</p>			

 <p>(-100, 0) (100, 0)</p>			
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Final Python translated condition for right triangles:

Equilateral Triangle:

Image	Sample x,y Values	Condition(s)	Python Translated Condition
 <p>(-100, 0) (100, 0)</p>			

Final Python translated condition for equilateral triangles:

Conclusion

Fill in the if/else statement below with the conditions you've determined. Then enter these conditions into your program! Remember: Else statements **do not** have an associated condition!

```

if _____:
    write_text("Obtuse Triangle", 20)
elif _____:
    write_text("Right Triangle", 20)
elif _____:
    write_text("Equilateral Triangle", 20)
else:
    write_text("Acute Triangle", 20)

```