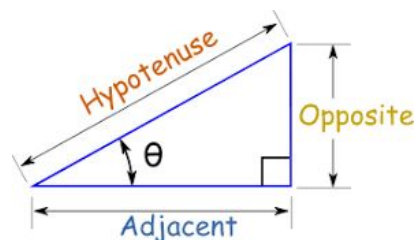


Drawing Right Triangles with Trigonometry



Project Goal:

Students will understand that trig functions offer more precision and exactness in drawing side lengths and angles. They will understand they do not have to round the lengths in programming

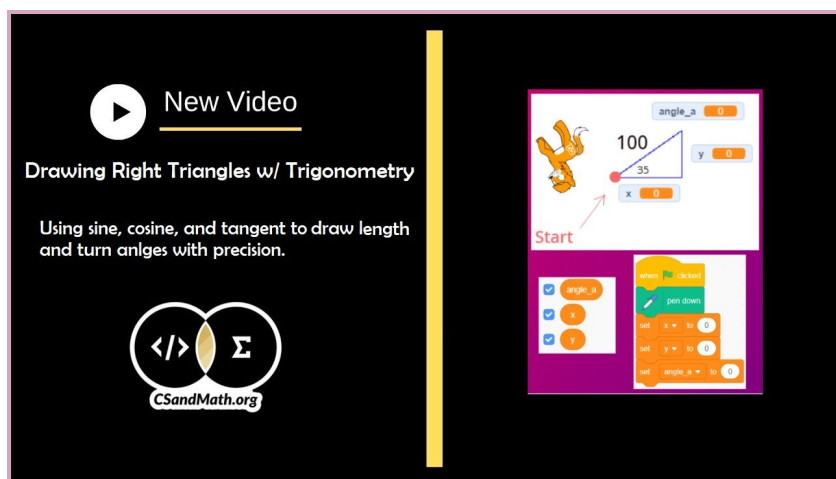
Standard:

[CCSS.MATH.CONTENT.HSG.SRT.C.8](#)

Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

Student Guide

Teacher Guide - Video tutorial linked to image



The video thumbnail features a play button icon and the title 'New Video Drawing Right Triangles w/ Trigonometry'. Below the title, it says 'Using sine, cosine, and tangent to draw length and turn angles with precision.' The CSandMath.org logo is at the bottom left. On the right, a screenshot of a Scratch script is shown, featuring a 'Start' block, a 'when green flag clicked' block, and a 'say' block with a speech bubble containing a right triangle diagram. The diagram shows a hypotenuse of length 100 and an angle of 35 degrees. The adjacent side is labeled 'x' and the opposite side is labeled 'y'. Below the script, there are blocks for 'set angle_a to 0', 'set x to 0', 'set y to 0', and 'set angle_a to 35'.

Prompt Images

Introduction

This task was picked because there will be confusion around the measure of the last angle turn. Students will use different ideas to close the triangle such

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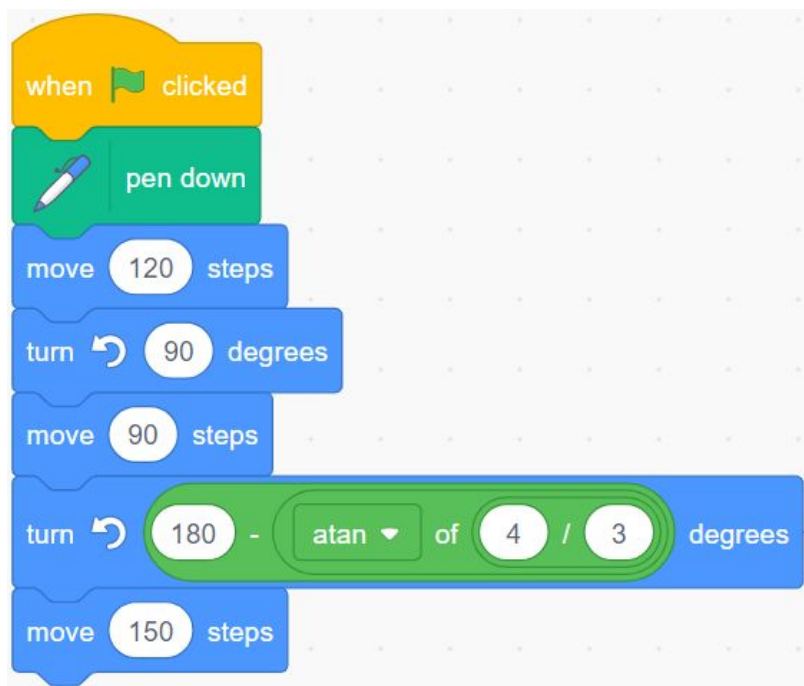


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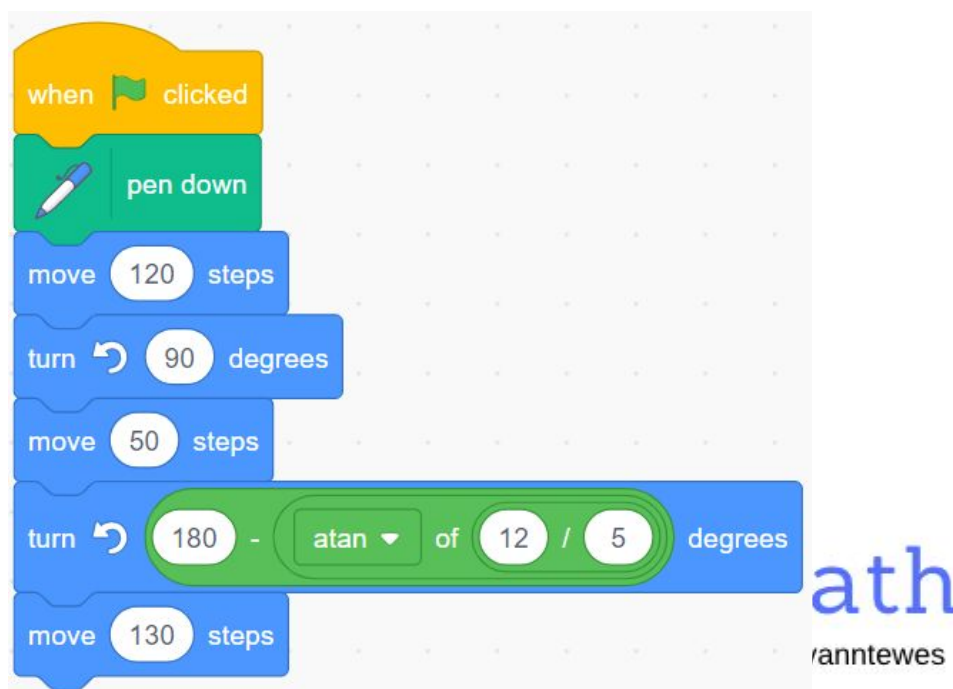
as using the Go-To command and sending the sprite back to (0,0) or guess/check the angle until it closes using a 143 degree exterior angle. Validate these responses!! Even these strategies, but then pose a 2nd prompt that requires them to use trigonometry.

Solutions:

Task 1



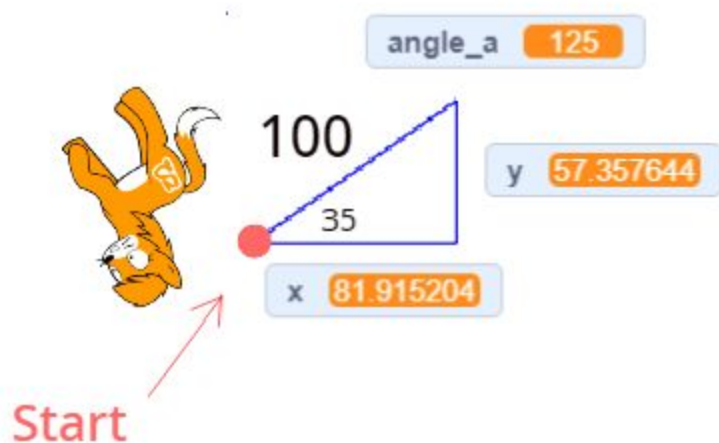
Task 2 Solution w/ Tangent Ratio



Task 3: Solutions may vary

```

when clicked
  pen down
  set x to 100 * cos of 35
  set y to 100 * sin of 35
  set angle_a to 180 - atan of x / y
  move x steps
  turn 90 degrees
  move y steps
  turn angle_a degrees
  move 100 steps
  
```



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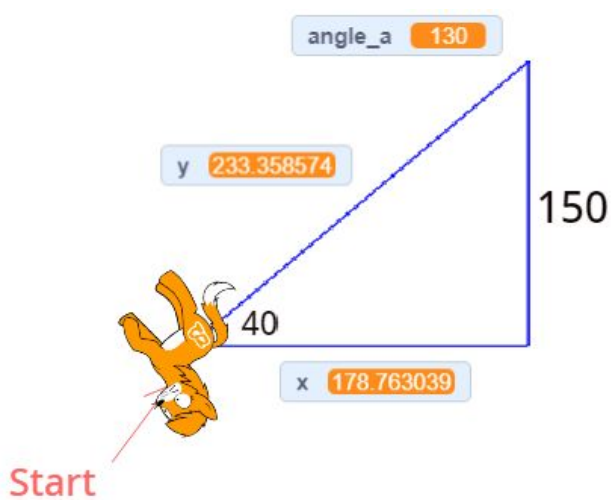


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Task 3B

```

when clicked
  pen down
  set x to 150 / tan of 40
  set y to 150 / sin of 40
  set angle_a to 180 - asin of x / y
  move x steps
  turn 90 degrees
  move 150 steps
  turn angle_a degrees
  move y steps
  
```



Obviously Task 4 Results will vary :)

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