Proportion and You

a breakout

What is a proportion really?

- *x* is proportional to *y* means:
  - both *x* and *y* are **changing**
  - AND
    - *y* is a constant multiple of *x*
    - (or) *y/x* is constant
    - (or) whenever *x* changes by a factor, *y* changes by the same factor.

What is a proportion really?

- *x* is proportional to *y* means:

  - both *x* and *y* are **changing**

  - AND

    - *y* is a constant multiple of *x* *y=mx*

    - (or) *y*/*x* is constant $y_i/x_i = y_j/x_j$

    - (or) whenever *x* changes by a factor, *y* changes by the same factor. $x \rightarrow kx, y \rightarrow ky$

Similar Triangles

2

1

?

3
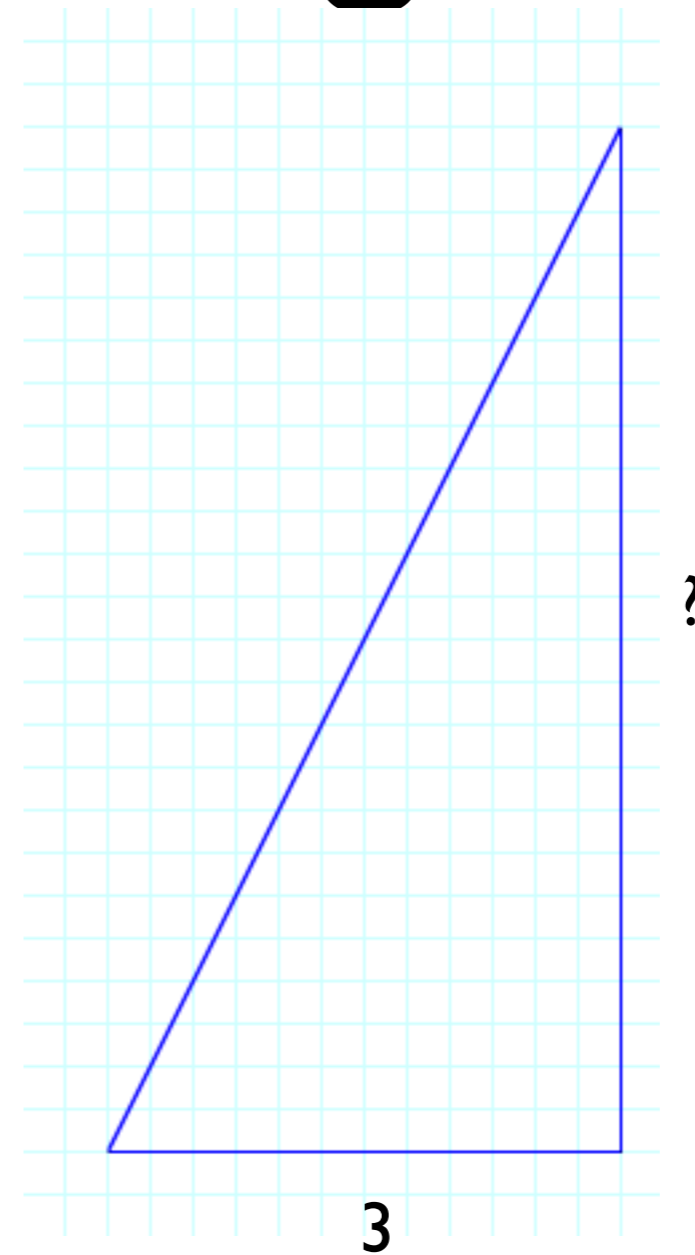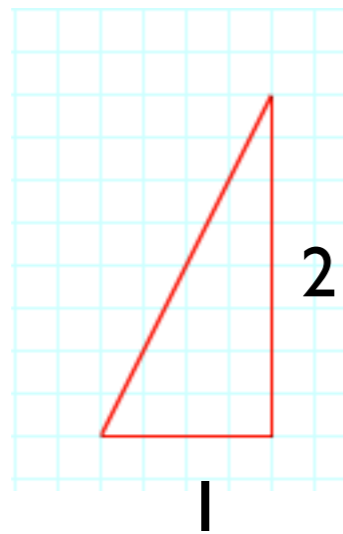
How do we see these as:
Constant multiple,
Constant ratio,
Constant scaling?

Core Standards (Grade 6)

- **Make tables of equivalent ratios** relating quantities with whole- number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

- Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?*
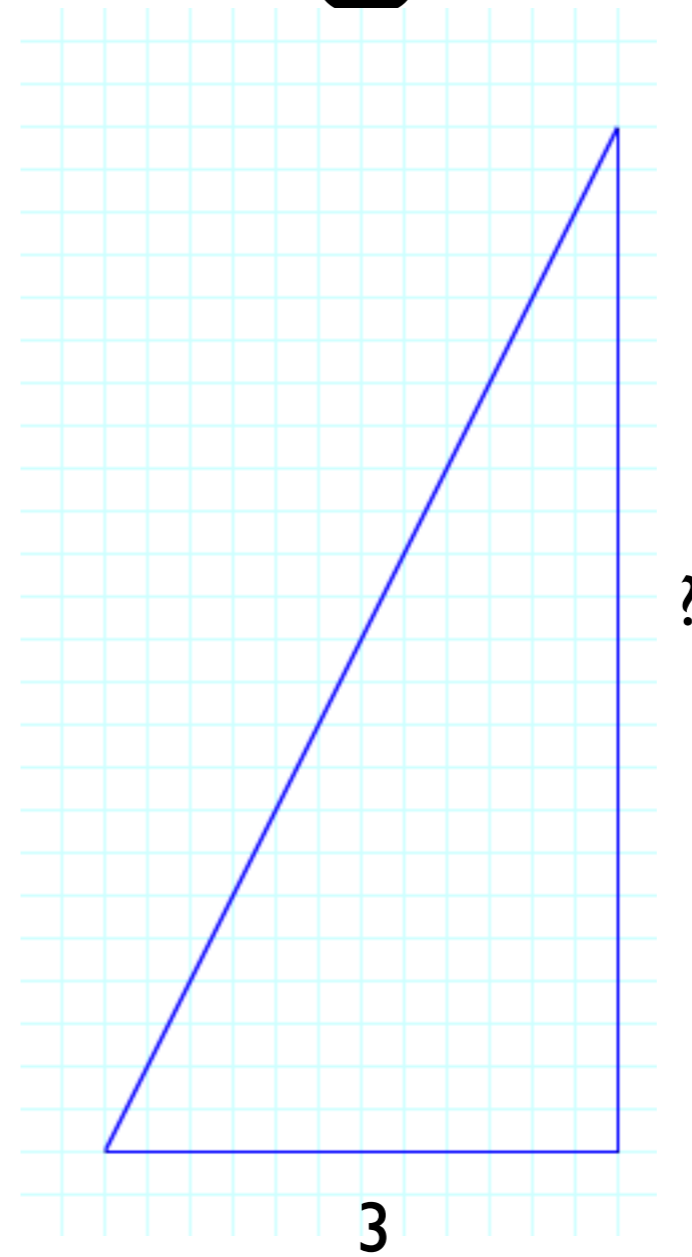
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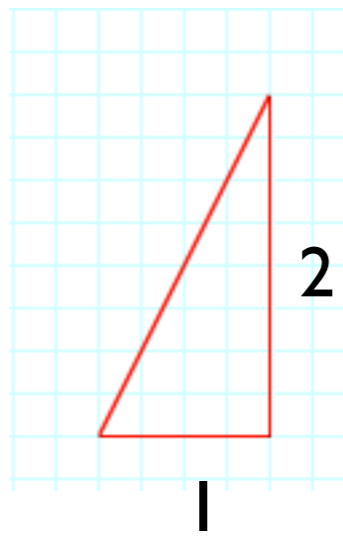
Core Standards (Grade 7)

- **Identify the constant of proportionality** (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

- **Represent proportional relationships by equations.** *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.*
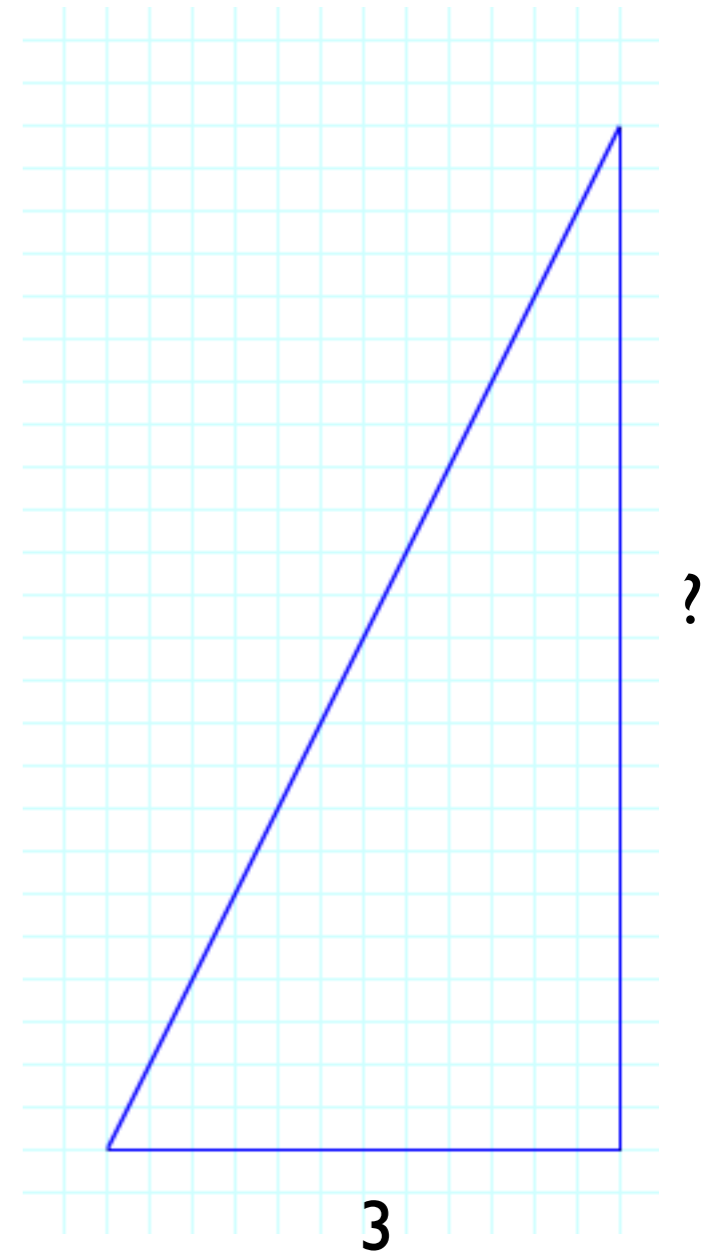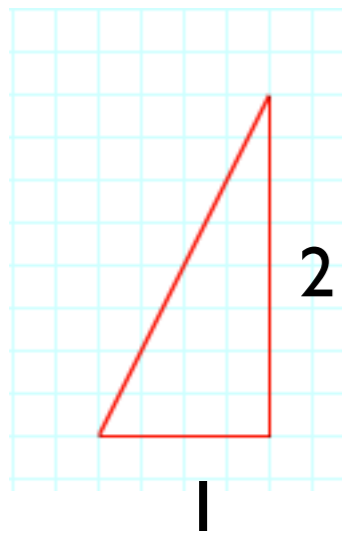
Core Standards (Grade 8)

- **Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane;** derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.
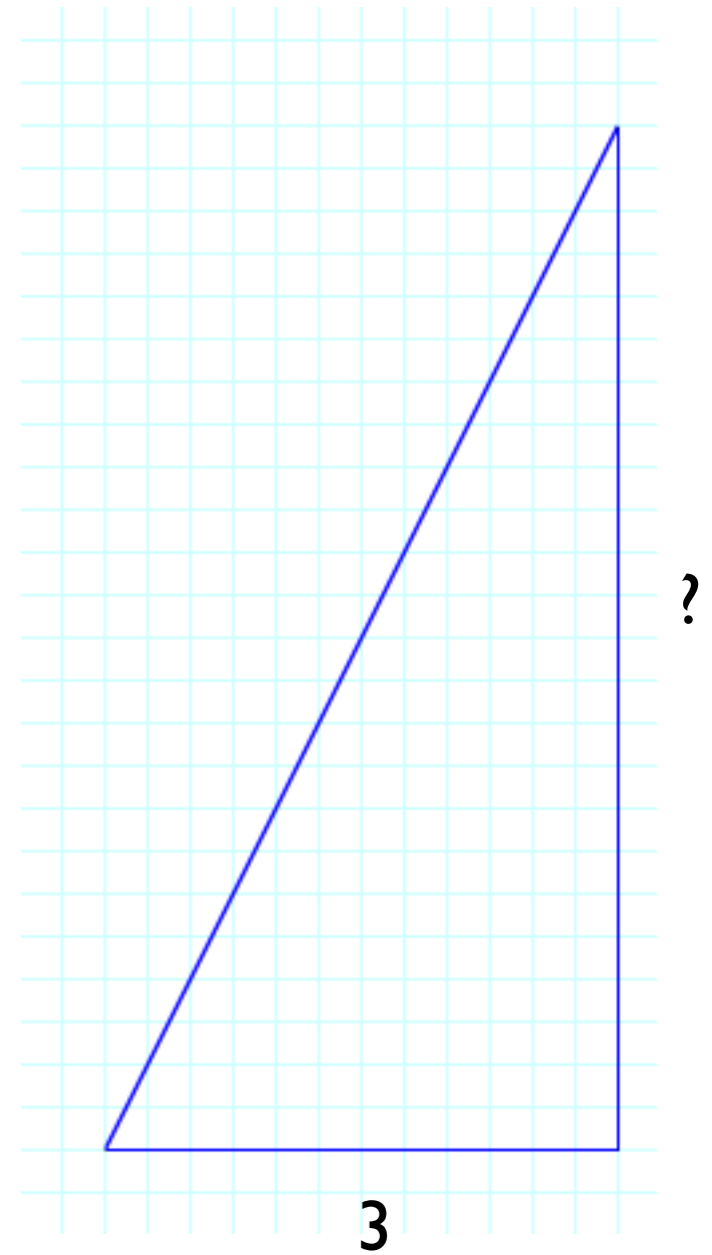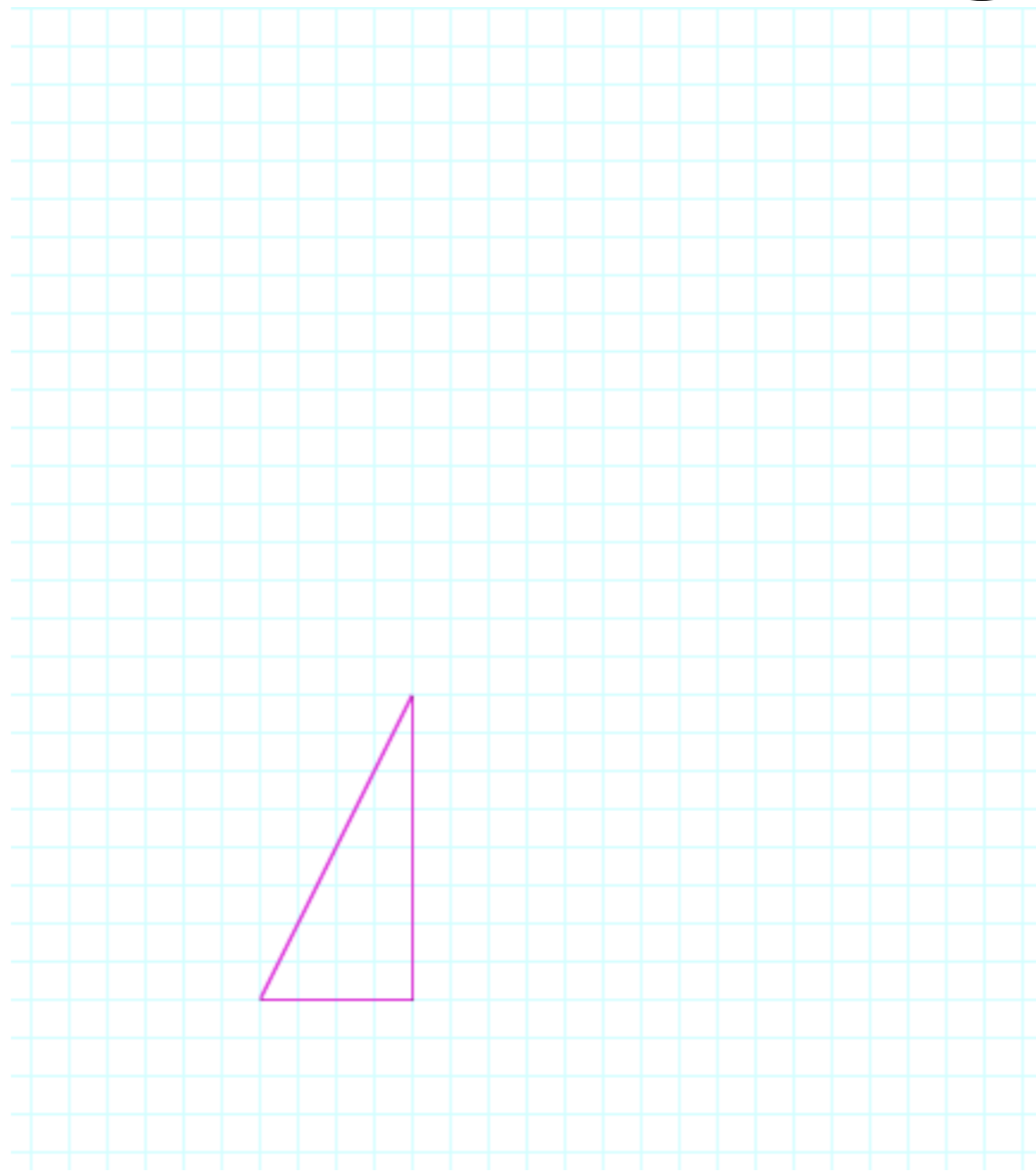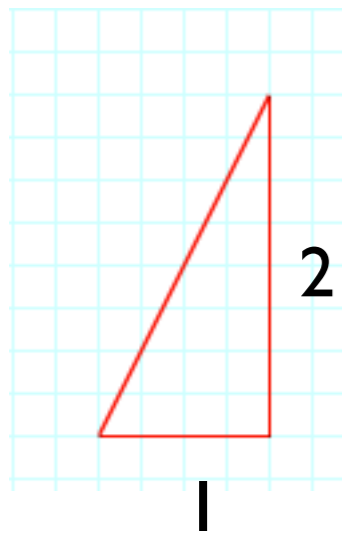
Similar Triangles
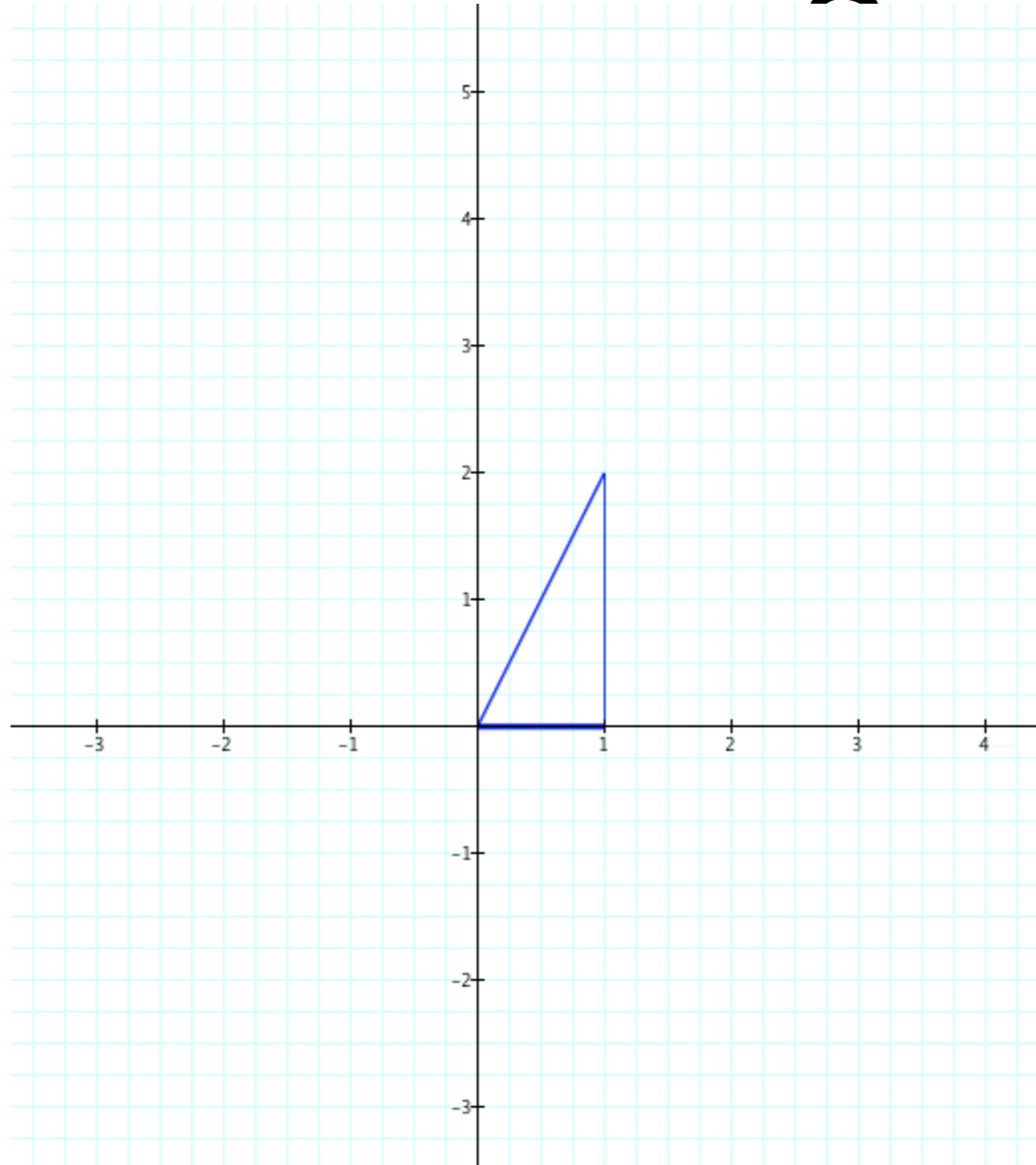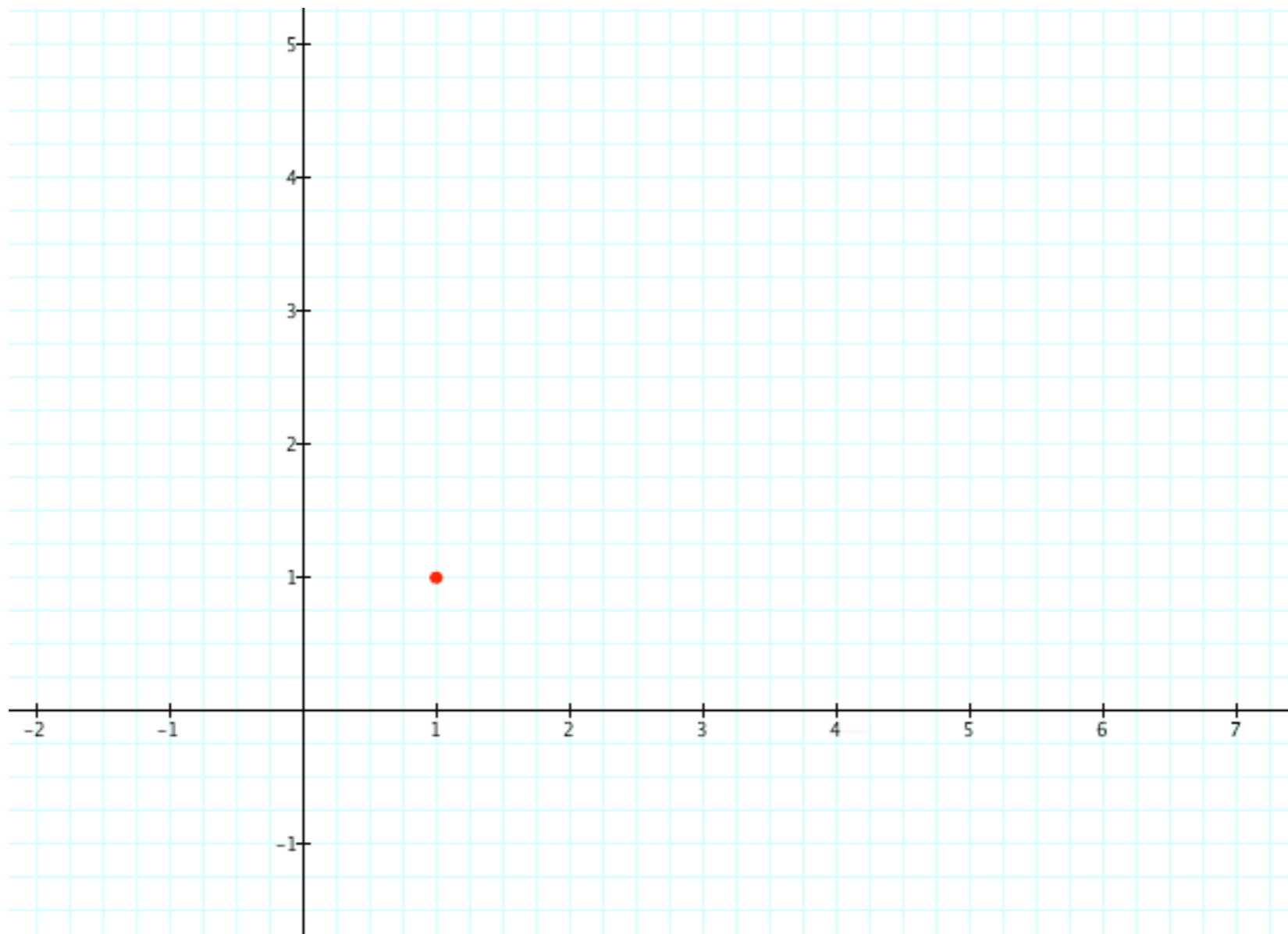
Similar Triangles

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Similar Triangles

Similar Triangles and Slope

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