

Making Sense of Radians

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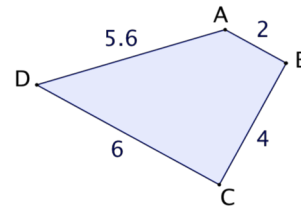
Radians as Proportionality Constants

- Fill-in all of the boxes as you review what it means to be **proportional**.

Two polygons are similar if their corresponding angles are

_____, and their corresponding

sides are _____.

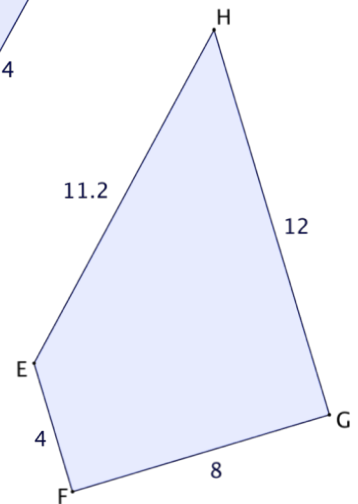


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In this example, $ABCD \approx EFGH$. That means:

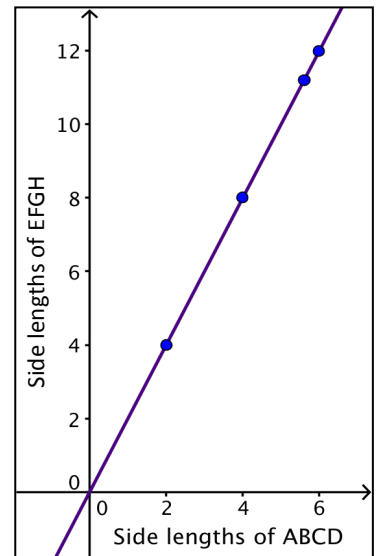
$$\angle A \approx \angle \square, \angle \square \approx \angle G, \angle \square \approx \angle F, \text{ and } \angle D \approx \angle \square$$

and $\frac{\square}{AB} = \frac{FG}{\square} = \frac{\square}{CD} = \frac{HE}{\square} = \frac{2}{1}$



- Here are other ways to show that the sides are proportional.

- $EF = 2 \square$, $\square = 2BC$, $\square = 2CD$, and $HE = 2 \square$
- EFGH is the result of a dilation of ABCD, with a scale factor of \square .
- Since the line passes through the origin, this graph shows that the relationship is **direct variation**. Saying that two quantities vary directly means the same as saying that they are proportional. The slope is the **constant of proportionality**; in this case, it is 2.



What does proportionality have to do with circles and radians? Explore this applet: <http://bit.ly/HhYAvh>

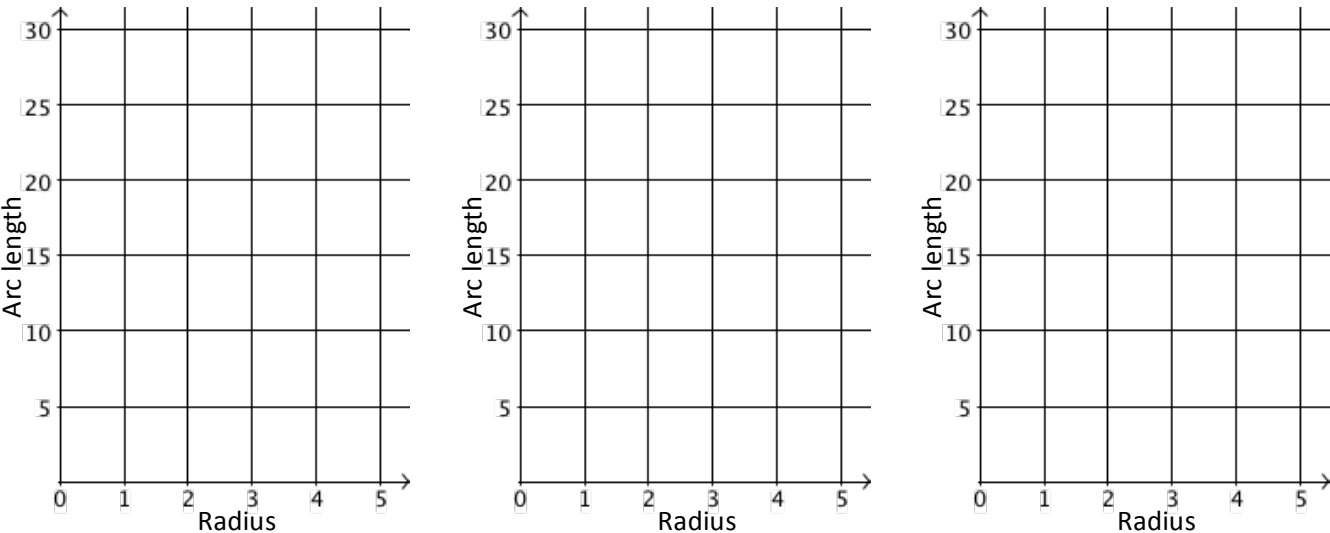
4. Use the applet to create 3 different tables, each using a different θ .

$\theta = \rule{1cm}{0.4pt}$		
r	s	s/r

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r	s	s/r

$\theta = \rule{1cm}{0.4pt}$		
r	s	s/r

5. Make 3 quick graphs.



6. For each θ , is arc length (s) proportional to radius (r)? How do you know?

7. How is the slope of each line related to the variables θ , r, and s?