$\qquad$
$\qquad$ Period $\qquad$
$\qquad$

LEARNING OBJECTIVE: We will prove the Pythagorean theorem using similar triangles. (G8M7L9)

## CONCEPT DEVELOPMENT:

We can use similar triangles to provide another proof of the Pythagorean Theorem:


Name these three triangles
$\triangle D A C$



Are these three triangles similar?
$\triangle D A C \sim \triangle C A B A^{A D}$ Similarity!
$\triangle C A B \sim \triangle D C B$
AA similarity

Proving the Pythagorean Theorem:
CORRESPONDING SIDES of SIMILLR $\triangle$ 's ARE PROPDRTIONNL

$$
\frac{\overline{A B}}{\overline{A C}} \times \frac{\overline{A C}}{A D}(\overline{A C})^{2}=\overline{A B} \cdot \overline{A D}
$$

$$
b^{2}=\overline{A B} \cdot \overline{A D}
$$

$$
\frac{\overline{A B}}{\overline{B C}} \times \frac{\overline{B C}}{\overline{B D}}(\overline{B C})^{2}=\overline{A B} \cdot \overline{B D} \quad a^{2}=\overline{A B} \cdot \overline{B D}
$$

$$
a^{2}+b^{2}=(\overline{A B} \cdot \overrightarrow{A D})+(\overline{A B} \cdot \overline{B D})
$$

$$
a^{2}+b^{2}=\overline{A B}(\overline{A D}+\overline{B D})
$$

$$
a^{2}+b^{2}=(\overline{A B})(\overline{A B})
$$

$$
a^{2}+b^{2}=(\overline{A B})^{2}
$$

$$
a^{2}+b^{2}=c^{2}
$$

$\qquad$ , Period $\qquad$
Mr. Rogove
Date: $\qquad$

Another Proof using Similar Triangles and Areas
$x^{2} \rightarrow \operatorname{area!}$

$\qquad$
$\qquad$ , Period $\qquad$
Mr. Rogove
Date: $\qquad$
GUIDED PRACTICE:
Steps for Proving the Pythagorean Theorem Using Similar Triangles

1. Draw a line from the right angle perpendicular to the hypotenuse. This will create three similar triangles.
2. Label, reorient, and draw the three similar triangles.
3. Set up a series of proportions to show that $a^{2}+b^{2}=c^{2}$ using the steps demonstrated on the first page of the notes.


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## INDEPENDENT PRACTICE:

No independent practice...

## Activating Prior Knowledge:

We know the Pythagorean Theorem is $a^{2}+b^{2}=c^{2}$ AND we know one way to prove it.


## CLOSURE:

Why are the three triangles created during the proof simitiar?

## Notes:

Maps to Grade 8, Lesson 15, Module 7.
HW could be lesson 15 problem set minus probs 1-2.

