

The Secret of Similar Right Triangles with Geometric Mean (Big Idea Geometry 9.3)

Lesson 051 | Geometry | Right-triangle geometric means

<https://www.youtube.com/watch?v=sbO5YMaYU>

Original practice aligned to the saved video title.

Name: _____ Date: _____ Show your reasoning.

01

The altitude to a right triangle's hypotenuse splits it into lengths 100 and 36. Find the altitude and both legs exactly.

02

The altitude to a right triangle's hypotenuse splits it into lengths 121 and 81. Find the altitude and both legs exactly.

03

The altitude to a right triangle's hypotenuse splits it into lengths 64 and 16. Find the altitude and both legs exactly.

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04

The altitude to a right triangle's hypotenuse splits it into lengths 36 and 16. Find the altitude and both legs exactly.

05

The altitude to a right triangle's hypotenuse splits it into lengths 100 and 25. Find the altitude and both legs exactly.

06

The altitude to a right triangle's hypotenuse splits it into lengths 4 and 16. Find the altitude and both legs exactly.

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- 01** The altitude to a right triangle's hypotenuse splits it into lengths 100 and 36. Find the altitude and both legs exactly.

Geometric-mean theorem: $\text{altitude}^2 = 100 \cdot 36$, so $\text{altitude} = 60$. Whole hypotenuse = 136. Legs are $10\sqrt{136}$ and $6\sqrt{136}$.

- 02** The altitude to a right triangle's hypotenuse splits it into lengths 121 and 81. Find the altitude and both legs exactly.

Geometric-mean theorem: $\text{altitude}^2 = 121 \cdot 81$, so $\text{altitude} = 99$. Whole hypotenuse = 202. Legs are $11\sqrt{202}$ and $9\sqrt{202}$.

- 03** The altitude to a right triangle's hypotenuse splits it into lengths 64 and 16. Find the altitude and both legs exactly.

Geometric-mean theorem: $\text{altitude}^2 = 64 \cdot 16$, so $\text{altitude} = 32$. Whole hypotenuse = 80. Legs are $8\sqrt{80}$ and $4\sqrt{80}$.

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04

The altitude to a right triangle's hypotenuse splits it into lengths 36 and 16. Find the altitude and both legs exactly.

Geometric-mean theorem: $\text{altitude}^2 = 36 \cdot 16$, so $\text{altitude} = 24$. Whole hypotenuse = 52. Legs are $6\sqrt{52}$ and $4\sqrt{52}$.

05

The altitude to a right triangle's hypotenuse splits it into lengths 100 and 25. Find the altitude and both legs exactly.

Geometric-mean theorem: $\text{altitude}^2 = 100 \cdot 25$, so $\text{altitude} = 50$. Whole hypotenuse = 125. Legs are $10\sqrt{125}$ and $5\sqrt{125}$.

06

The altitude to a right triangle's hypotenuse splits it into lengths 4 and 16. Find the altitude and both legs exactly.

Geometric-mean theorem: $\text{altitude}^2 = 4 \cdot 16$, so $\text{altitude} = 8$. Whole hypotenuse = 20. Legs are $2\sqrt{20}$ and $4\sqrt{20}$.