

M155: Right Triangle Trigonometry Post-Badge Task

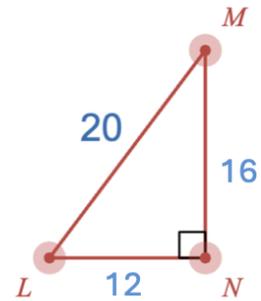
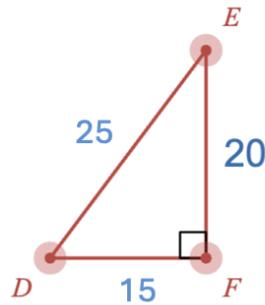
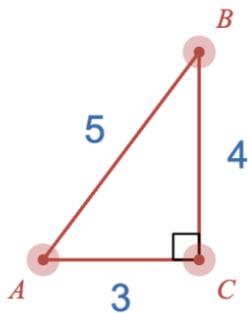
Reflecting on Badge Learning

Now that you have learned more about right triangle geometry, respond to the questions that follow. These are the same questions you responded to before the start of this badge.

QUESTION 1 Triangle ABC is a right triangle with sides of length 3, 4, and 5. Triangle DEF and Triangle LMN are similar to Triangle ABC. Find the unknown side lengths.



Note: Triangles are not drawn to scale

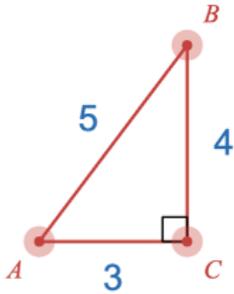


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QUESTION 2 Triangle ABC is a right triangle with sides of length 3, 4, and 5. Triangle DEF and Triangle LMN are similar to Triangle ABC. Evaluate the given trigonometric expressions.

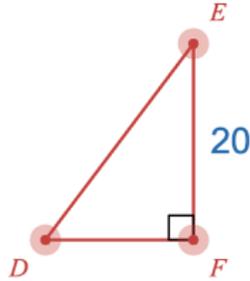


Note: Triangles are not drawn to scale



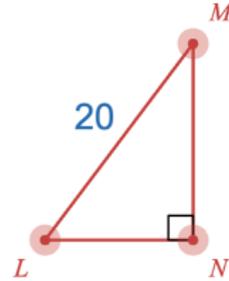
$$\cos A = \frac{3}{5}$$

$$\sin B = \frac{3}{5}$$



$$\cos D = \frac{3}{5}$$

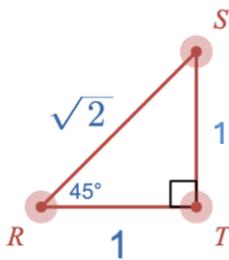
$$\sin E = \frac{3}{5}$$



$$\cos L = \frac{3}{5}$$

$$\sin M = \frac{3}{5}$$

QUESTION 3 Triangle RST is a special right triangle with angles 45° , 45° , and 90° . Find the unknown side lengths. Then evaluate each trigonometric expression.



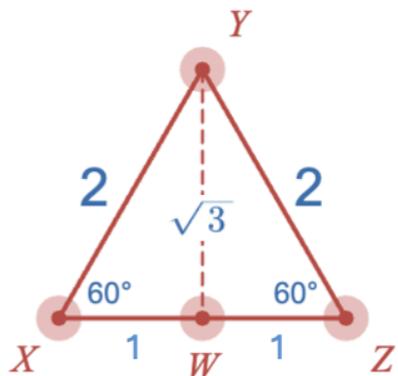
$$\cos 45^\circ = \frac{1}{\sqrt{2}} \text{ or } \frac{\sqrt{2}}{2}$$

$$\sin 45^\circ = \frac{1}{\sqrt{2}} \text{ or } \frac{\sqrt{2}}{2}$$

$$\tan 45^\circ = 1$$

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QUESTION 4 Triangle XYZ is an equilateral triangle with sides of length 2. Point W bisects side XZ. Find the length of YW. Then evaluate each trigonometric expression.



$$YW = \sqrt{3}$$

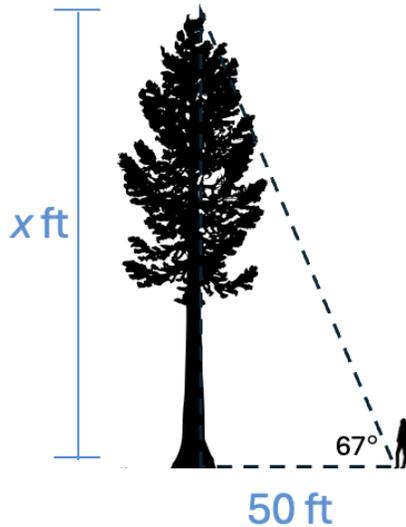
$$\cos 60^\circ = \frac{1}{2}$$

$$\sin 60^\circ = \frac{\sqrt{3}}{2}$$

$$\tan 60^\circ = \sqrt{3}$$

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QUESTION 5 While visiting Sequoia National Forest, Ariana was using her math skills to calculate the height of some trees. She stood 50 feet away from a particular tree. Using a special tool, she measured the angle of elevation to the top of the tree as 67° . Determine the height of the tree. Show the calculations you use to determine your answer.

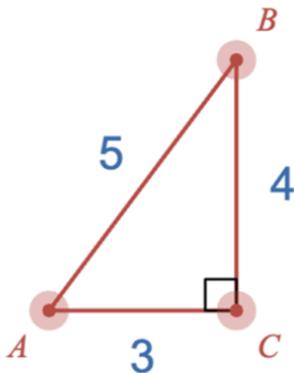


$$\tan(67^\circ) = \frac{x}{50}$$

$$50 \tan(67^\circ) = x$$

$$x = 117.8 \text{ ft}$$

QUESTION 6 Triangle ABC is a right triangle with sides of length 3, 4, and 5. Calculate the value of the trigonometric expression below.



$$(\cos A)^2 + (\sin A)^2 = 1$$

$$(\cos B)^2 + (\sin B)^2 = 1$$

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QUESTION 7 What else did you learn that was not reflected in Questions 1-6?



Answers will vary. Possible student response:

- I also learned that the sine of an acute angle in a triangle is equal to the cosine of the complementary angle. So, for example in question 2 above $\sin B$ and $\cos A$ are both $4/5$.

QUESTION 8 Compare your answers to these questions now to your answers from the earlier attempt. What do you notice about your progress?



Answers will vary. Look for students to explain what they know now compared to what they knew when responding to the pre-test.