

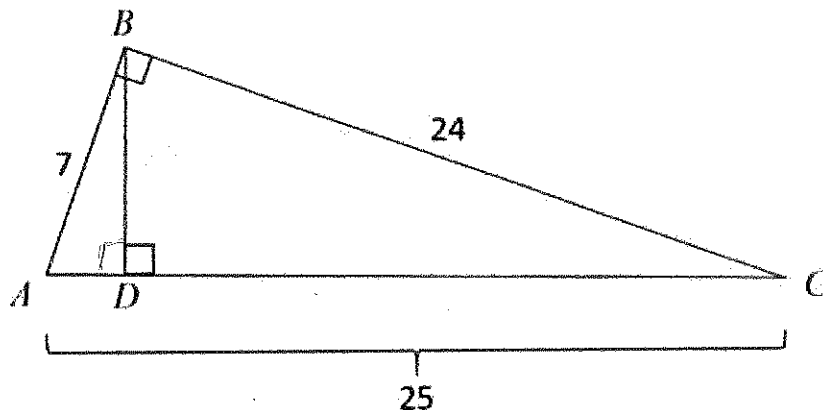
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Page 1:

Question 1 (3 points)



In blank 1 give the length of AD. (in simplified fraction form)

In blank 2 give the length of BD. (in simplified fraction form)

In blank 3 give the length of CD. (in simplified fraction form)

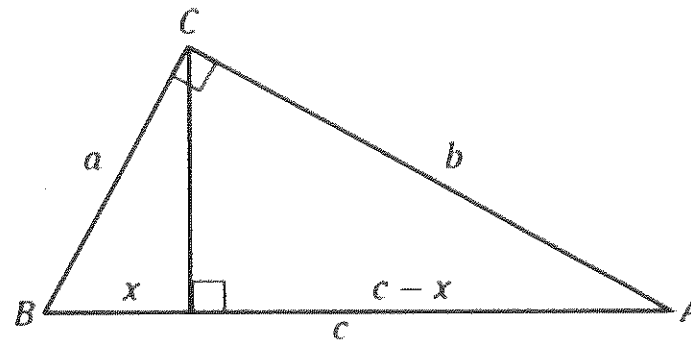






#2

Choose which blank each item should go in to complete the proof.



A right triangle ABC has side lengths a , b , and c . An altitude is drawn from C to the opposite side, dividing c into lengths x and $c - x$. Since the altitude from C divides the triangle into smaller similar right triangles by the 1 criterion, then:

$\frac{a}{x} = \frac{\text{2}}{a}$ $a^2 = \text{4}$	$\frac{b}{c - x} = \frac{\text{3}}{b}$ $b^2 = \text{5}$
$a^2 + b^2 = \text{6} + \text{7} = c^2$	
$a^2 + b^2 = c^2$	



6 ▼

CX

2 ▼

C

3 ▼

C

1 ▼

Angle Angle (AA)

3 ▼

CX

7 ▼

$c(c-x)$

5 ▼

$c(c-x)$



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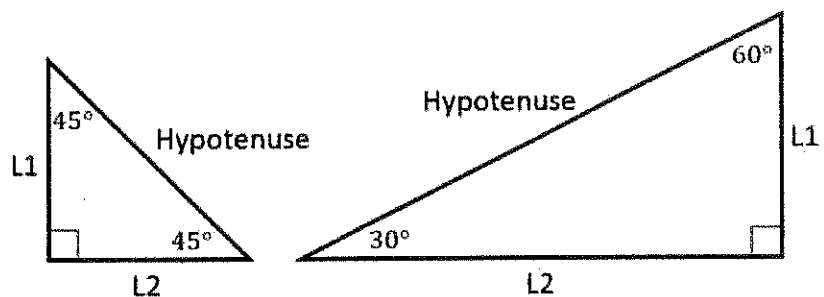
#3

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7	8	9
10	11	12
13	14	15
16	17	

Select the number of the blank that each answer should go in to complete the table.

Consider the two triangles.



Each row of the table shows the lengths of the legs and hypotenuses of these triangles.

Triangle	L1	L2	Hypotenuse
30° – 60° – 90°	1	2	10
45° – 45° – 90°	5	3	4

5

 $5\sqrt{3}$

 $5\sqrt{2}$

5

Question 4 (1 point)

What value of θ makes the statement true?

$$\cos(\theta) = \sin\left(\frac{\theta}{3} - 10\right)$$

34

#4

Question 4 (1 point)

What value of θ makes the statement true?

$$\cos(\theta) = \sin\left(\frac{\theta}{3} - 10\right)$$

☐ 75

☐ 150

☐ 15

☐ 60



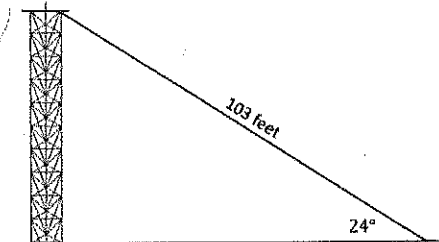
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#5



Values in the table are rounded to the ten-thousandths place.

Angle Measure, θ	$\sin \theta$	$\cos \theta$	$\tan \theta$
24°	0.4067	0.9135	0.4452

Use the values in the table to calculate the following distances. Round your answers to the nearest tenth.

The distance from the base of the utility tower to the location where the wire is attached to the ground is feet.The wire attaches to the utility tower at a height of feet.

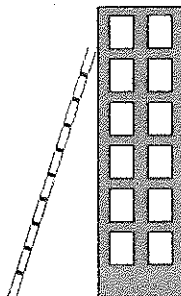
Round your answer to the nearest tenth.





#6

Question 6 (1 point)

A ladder is leaning against a building. The ladder forms an angle of 77° with the ground. The distance from the base of the ladder to the base of the building is 8 feet.

How high on the building does the ladder make contact? Round your answer to the nearest hundredth.

Values in the table are rounded to the ten-thousandths place.

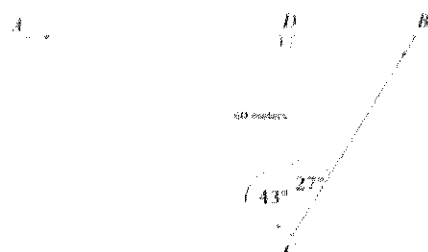
Angle Measure, θ	$\sin \theta$	$\cos \theta$	$\tan \theta$
77°	0.9744	0.2250	4.3315

Round your answer to the nearest hundredth.



Question 7 (1 point)

Reiny stands on a dock at the edge of a lake represented by point C . Points A and B represent two houses anchored in the lake. Reiny plans to open her C to A , then to B , and then back to C . The straight distance from Reiny to the water point A is 60 meters and is measured from C to A .



What is the total distance, in meters, that Reiny will walk? Round your answer to the nearest whole number.

Values in the table are rounded to the nearest hundredth.

Trigonometric Ratios: $\theta = 27^\circ$, $a = 60$

$$\sin \theta = 0.45 \quad 0.68$$

$$\cos \theta = 0.89 \quad 0.73$$

$$\tan \theta = 0.51 \quad 0.93$$

Round your answer to the nearest whole number.



Question 6 (1 point)

418

Let O , P , and Q be distinct collinear points with $PQ=3$. Let P' and Q' be the images of points P and Q under dilation from point O with scale factor 4. What is the length of the image segment $P'Q'$?

☐ 9

☐ 7

☐ 12

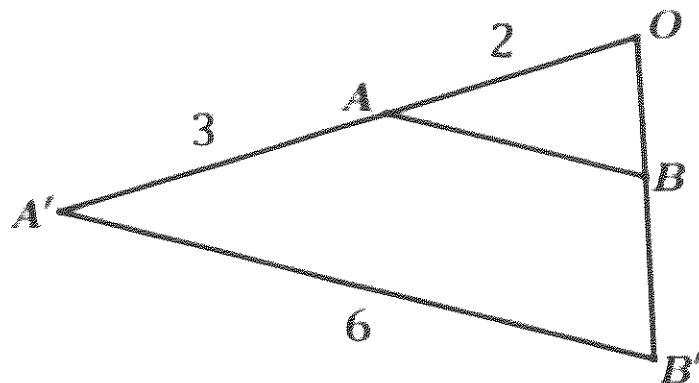
☐ 1



CHOOSE THE BEST ANSWER.

419

In the diagram, $\triangle OA'B'$ is a scale drawing of $\triangle OAB$. What is the length of AB ?



☐ 4

☐ 1

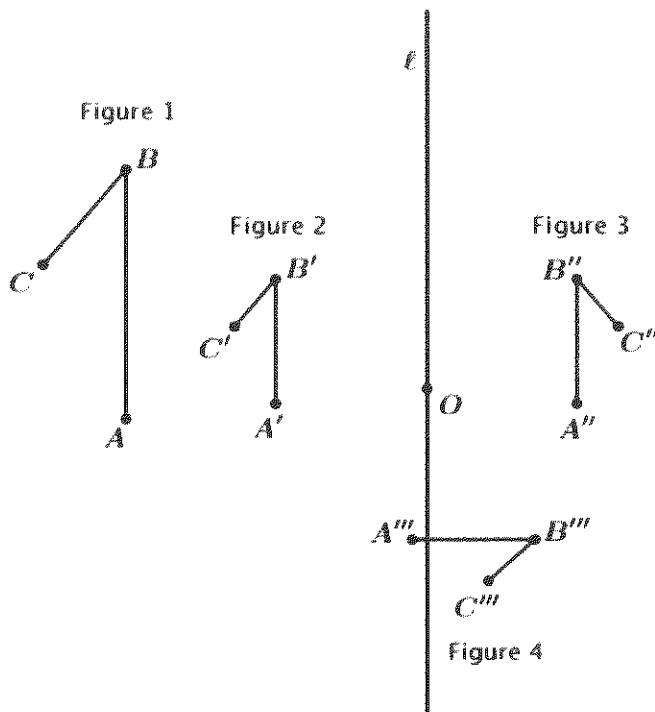
☐ 2.4

☐ 1.67



Question 10 (3 points)

Figure 1 and Figure 4 are similar. Identify the rigid motions and dilations that show that Figure 1 and Figure 4 are similar.



- Figure 2 is the image



Question 11 (2 points)

497

If Figure 1 is similar to Figure 2, which of the following **must** be true?

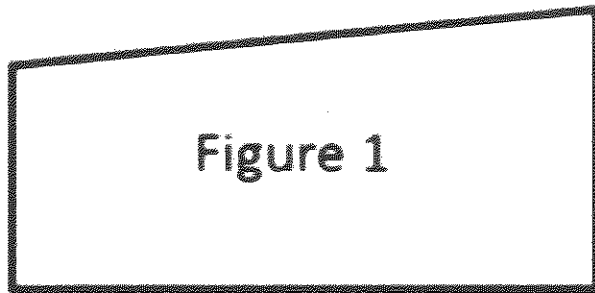


Figure 1

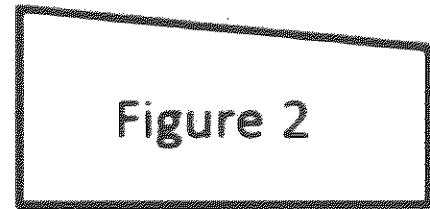


Figure 2

- ☐ All corresponding angle measures are equal.
- ☐ All corresponding lengths are in equal ratio.
- ☐ All corresponding lengths are equal.

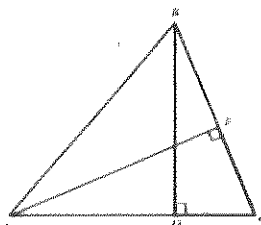


- ☐ All corresponding lengths are in equal ratio.
- ☐ All corresponding lengths are equal.
- ☐ There exists a finite composition of dilations and rigid motions that maps Figure 1 to Figure 2.
- ☐ There exists a finite composition of rigid motions that maps Figure 1 to Figure 2.



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In the diagram, $BD \perp AC$ and $AE \perp CB$



Complete the proof to show $\triangle AEF \cong \triangle BDC$

$\angle BDC$ and $\angle AEF$ are right angles by the definition of

1

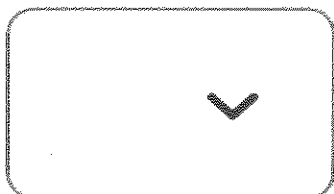
and all right angles are congruent, so $\angle BDC \cong \angle AEF$. Both $\triangle AEF$ and $\triangle BDC$ share $\angle C$ and $\angle C \cong \angle C$ by the

2

property. Therefore $\angle AEF \cong \angle BDC$ by the

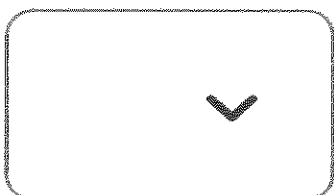
3

theorem for proving similar triangles.



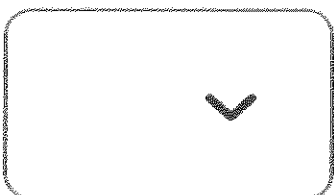
AA

1. Blar
1



reflexive

2. Blar
2



perpendicular
lines

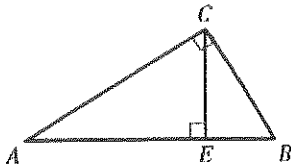
3. Blar
3



43
Question 13 (1 point)

Choose the best answer.

In right triangle ABC with the right angle at vertex C , altitude $\overline{CE}$ is drawn from vertex C to $\overline{AB}$. Which similarity statement correctly relates the three triangles in the diagram?



☐ $\triangle ABC \sim \triangle CAE \sim \triangle BCE$

☐ $\triangle ABC \sim \triangle ACE \sim \triangle CBE$

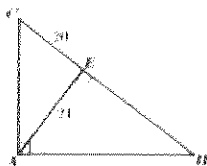
☐ $\triangle ABC \sim \triangle ACE \sim$

☐ $\triangle ABC \sim \triangle AEC \sim \triangle EBC$

Question 14 (1 point)

Give your answer to the nearest hundredth.

In right triangle ABC with the right angle at vertex A , altitude AD is drawn from vertex A to hypotenuse BC . $BD = 4$, $AD = 11$, and $CD = 20$. Find the length of AB . Round your answer to the nearest hundredth.



Question 15 (3 points)

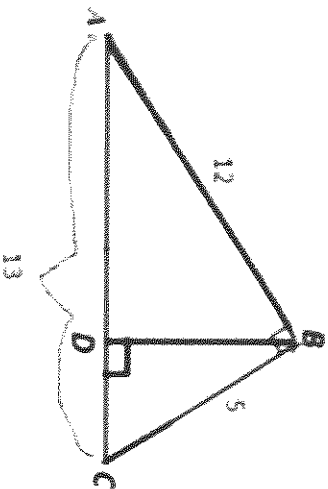
Consider $\triangle ABC$ with altitude $\overline{BD}$ drawn to its hypotenuse. $AB = 12$, $BC = 5$, and $AC = 13$.



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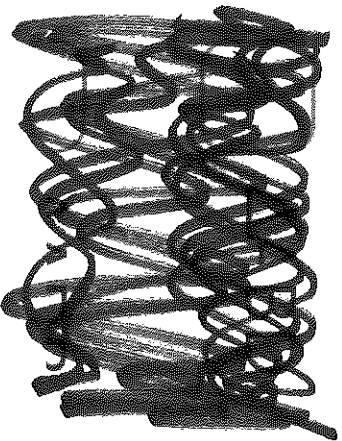
Question 15 (3 points)

Consider $\triangle ABC$ with altitude $\overline{BD}$ drawn to its hypotenuse. $AB = 12$, $BC = 5$, and $AC = 13$.



Part A

Which triangles are similar to $\triangle ABC$? Select all that apply.



☐ ΔABD

☐ ΔADB

☐ ΔBCD

☐ ΔBDC

☐ ΔDCB

Question 12 (7 points)

