5.2: (Trigonometry of Right Triangles)

A man stands 123 feet away from the base of a flagpole. He measures the angle of elevation to the top of the flagpole as $30°$. If his eyes are 5 feet above the ground, then the height of the flagpole is A) $5 + 41\sqrt{3}$ft. B) $5 + 123\sqrt{3}$ft. C) $46\sqrt{3}$ft. D) $36\sqrt{3}$ft E) $\frac{123}{2}$ ft	Trigonometry of Right Triangles.
If a student stands at the top of a cliff and looks down at a $60°$ angle of depression at the base of a tree that is 123 m away from the bottom of the cliff, then the height of the cliff is A) $123\sqrt{3}$ B) $41\sqrt{3}$ C) 123 D) 41 E) $123 + 41\sqrt{3}$	Trigonometry of Right Triangles.

A 10 meters ladder is placed against a wall and forms an angle of $45°$ with the ground. If the foot of the ladder is moved away from the wall the angle changes to $30°$. The exact distance moved by the top of the ladder on the wall is A) $5\sqrt{3}+1$ B) $5(\sqrt{2}-1)$ C) 5 D) $3\sqrt{5}-1$ E) $5\sqrt{2}$	Trigonometry of Right Triangles.
If the angle of elevation from a point 18 feet from the base of a tree to the top of the tree is θ and if $\sin\theta = \frac{4}{5}$, then the height of the tree is A) 24 feet B) 20 feet C) 13.5 feet D) 21 feet E) 27 feet	Trigonometry of Right Triangles.
If the angle of depression from the top of a television tower to a point on the ground 36 meters from the bottom of the tower is $30°$, then the height of the tower is A) $12\sqrt{3}$ meters B) $36\sqrt{3}$ meters C) $36\sqrt{2}$ meters D) $18\sqrt{2}$ meters E) 18 meters	Trigonometry of Right Triangles.

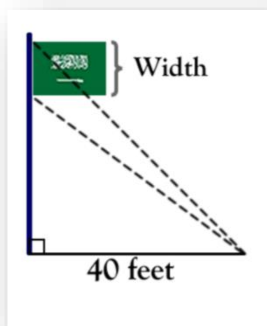
The angle of depression from the top of a building to a point on the ground is $60°$. How far is the point from the bottom of the building if the building is 300 meters high? A) $100\sqrt{3}$ m B) $300\sqrt{3}$ m C) $600\sqrt{3}$ m D) $400\sqrt{3}$ m E) 600 m	Trigonometry of Right Triangles.
A 20ft ladder leans against a building so that the angle between the ground and the ladder is θ. If $\cot\theta = \frac{4}{3}$, then the height at which the ladder reaches on the building is A) 12ft B) 10ft C) 5ft D) 30ft E) 8ft	Trigonometry of Right Triangles.
From a point on the ground $100\sqrt{3}ft$ from the base of a building, an observer finds that the angle of elevation to the top of the building is 30 " and that the angle of elevation to the top of a flagpole on top of the building is a, with $\tan a = \frac{21}{20\sqrt{3}}$. Find the length of the flagpole. A) 5 feet B) 4 feet C) 6 feet D) 3 feet E) 7 feet	Trigonometry of Right Triangles.

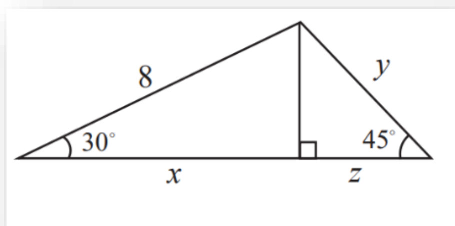
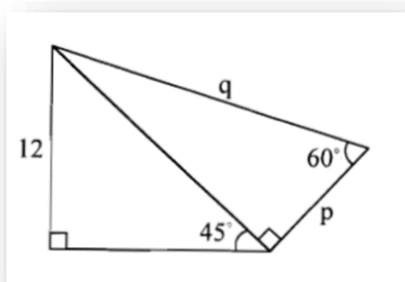
From a window 20 feet above the street, the angle of elevation to the top of the building across the street is $60°$, and the angle of depression to the base of the building is $20°$, the height of the building across the street is: A) $20(1+\sqrt{3}\cot 20°)$ B) $20\sqrt{3}\tan 20°$ C) $20(1+\sqrt{3}\tan 20°)$ D) $20\sqrt{3}\cot 20°$ E) $20\sqrt{3}$	Trigonometry of Right Triangles.
A 20ft ladder leans against a building so that the angle between the ground and the ladder is α. If $\tan\alpha = \frac{1}{2}$, how high does the top of the ladder reach on the building? A) $4\sqrt{5}$ B) 10 C) 4 D) $8\sqrt{5}$ E) 8	Trigonometry of Right Triangles.

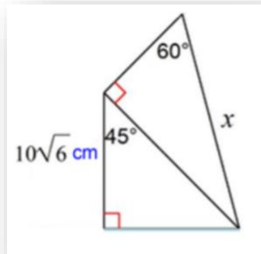
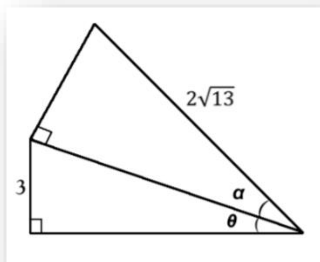
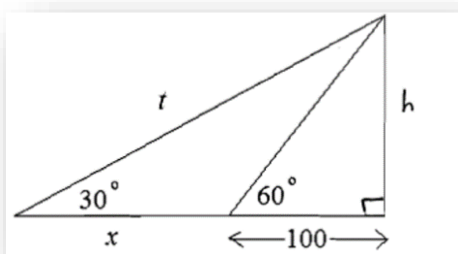
The angle of depression from the top of a building to the bottom of a tower is 30° and the angle of elevation from the top of the building to the top of the tower is 60°. If the distance between the building and the tower is 60 meters, then the height of the tower in meters is: A) $80\sqrt{3}$ B) $60(\sqrt{3}+1)$ C) $30(\sqrt{3}-1)$ D) $45\sqrt{3}$ E) 100	Trigonometry of Right Triangles.
A 10 meters ladder is placed against a wall and forms an angle of 30° with the ground. If the foot of the ladder is moved toward the wall, the angle changes to 60°. The exact distance moved by the top of the ladder on the wall is A) $5(\sqrt{3}-1)$ B) $5(\sqrt{3}-\sqrt{2})$ C) $5(\sqrt{2}-1)$ D) $5\sqrt{2}$ E) $5\sqrt{3}$	Trigonometry of Right Triangles.

Mohammad wants to find the height of a tree. From a point on the ground he finds that the angle of elevation to the top of the tree is $60°$. He then moves back 50 meters from the second point, the angle of elevation to the top of the tree is $45°$, the height of the tree is A) $75 + 25\sqrt{3}$ B) $25 + 25\sqrt{3}$ C) $50 + 25\sqrt{3}$ D) $50 - 25\sqrt{3}$ E) $75 - 25\sqrt{3}$	Trigonometry of Right Triangles.
A helicopter is flying 450 feet above the ground level. If the angle of depression from the helicopter to the base of a flagpole is θ, where $\sin\theta = \frac{5}{13}$, then the horizontal distance the helicopter must fly to be directly over the flagpole is A) 1080 feet B) 187.5 feet C) 1170 feet D) 173.1 feet E) 487.5 feet	Trigonometry of Right Triangles.

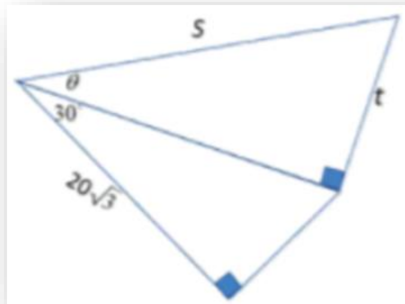
If from the top of a 60 meters tower, an observer finds that the angle of depression to the bottom of a building opposite to the tower is α. where $\sec\alpha = 3$, then the distance in meters between the tower and the building is A) $15\sqrt{2}$ B) $2\sqrt{2}$ C) $30\sqrt{2}$ D) $60\sqrt{2}$ E) $120\sqrt{2}$	Trigonometry of Right Triangles.
The angle of depression from the top of a building to a point on the ground is $30°$. How far is the point from the bottom of the building if the building is 252 meters high? A) $252\sqrt{3}$ m B) 504 m C) $\frac{504\sqrt{3}}{3}$ m D) 126 m E) $126\sqrt{3}$ m	Trigonometry of Right Triangles.

If the angle of elevation from a point 12 feet from the base of a building to the top of the building is θ and if $\sec\theta = \frac{5}{4}$, then the height of the building is A) 9 feet B) 16 feet C) $\frac{36}{5}$ feet D) 8 feet E) $\frac{48}{5}$ feet	Trigonometry of Right Triangles.
Measurements taken 40 feet from the base of a flagpole show the angle of elevation to the top of the flagpole to be 60° and the angle of elevation to the bottom of the flag to be 45°. Determine the vertical width of the flag.  A) $40(\sqrt{3}-1)$ feet B) $6\sqrt{3}$ feet C) $\frac{20\sqrt{3}}{3}$ feet D) 12 feet E) $\frac{40\sqrt{3}}{3}$ feet	Trigonometry of Right Triangles.

From the top of a tower, a man finds that the angle of depression to a car on the ground is 30°. If the car is 60 meters away from the tower, then the height of the tower in meters is A) 80 B) $80\sqrt{3}$ C) 20 D) $20\sqrt{2}$ E) $20\sqrt{3}$	Trigonometry of Right Triangles.
In the adjacent figure, the value of $\frac{x \cdot y}{\sqrt{3}}$ is A) $16\sqrt{2}$ B) 32 C) 36 D) 24 E) $24\sqrt{3}$  	Trigonometry of Right Triangles.
In the adjacent figure, $p + q =$ A) $12\sqrt{6}$ B) $4\sqrt{6} + 3\sqrt{2}$ C) $18\sqrt{6}$ D) $6\sqrt{2} + 4\sqrt{3}$ E) $15\sqrt{2}$  	Trigonometry of Right Triangles.

In the adjacent figure, $x =$ A) 40 cm B) $40\sqrt{3}$ cm C) $20\sqrt{3}$ cm D) 20 cm E) $20\sqrt{6}$ cm  	Trigonometry of Right Triangles.
In the following figure, if $\tan\alpha = \frac{2}{3}$, then $\theta =$ A) 30° B) 45° C) 15° D) 75° E) 60°  	Trigonometry of Right Triangles.
From the adjacent figure $x + t =$ A) $200(\sqrt{3}+1)$ B) 200 C) $100\sqrt{3}$ D) $100(\sqrt{3}+1)$ E) $100(\sqrt{3}-1)$  	Trigonometry of Right Triangles.

<table>
<tr>
<td>In the figure below, if $\sin\theta = \frac{4}{5}$, then $S + t =$



A) 120
B) $\frac{100\sqrt{3}}{3}$
C) $80\sqrt{3}$
D) 100
E) $\frac{80\sqrt{3}}{3}$</td>
<td>Trigonometry of Right Triangles.</td>
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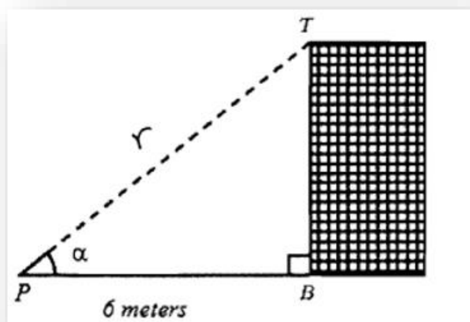
<tr>
<td>The angle of elevation from a point P that is 6 meters from the base of a building to the top of the building is α. If $\sin\alpha = \frac{4}{5}$ then the height of the building is



A) 8 meters
B) 3 meters
c) 16 meters
D) 9 meters
E) 64 meters</td>
<td>Trigonometry of Right Triangles.</td>
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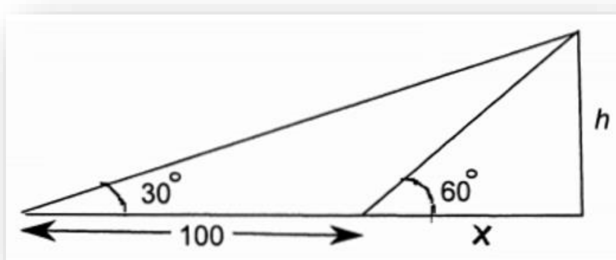
<tr>
<td>In the adjacent figure $h =$



(a) 50
(b) $50\sqrt{3}$
(c) $100(\sqrt{3} - 1)$
(d) $100\sqrt{3}$
(e) $\frac{50\sqrt{3}}{3}$</td>
<td>Trigonometry of Right Triangles.</td>
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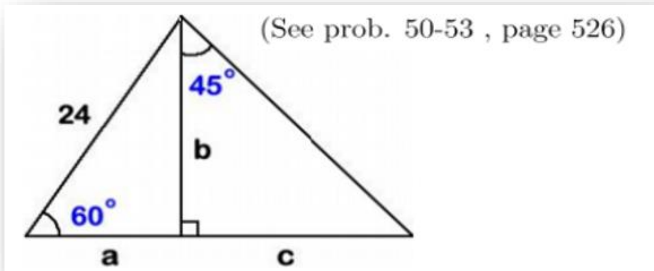
The value of $2a + \frac{b}{\sqrt{3}} - \sqrt{3}c$ in the adjacent figure is  A) 0 B) $12\sqrt{3}$ C) $24\sqrt{3}$ D) $-12\sqrt{3}$ E) 12	Trigonometry of Right Triangles.
If A and B are the two acute angles in a right triangle, then $\frac{\sec B}{\sec A} =$ A) $\cos A$ B) $\sin A$ C) $\tan A$ D) 1 E) $\cot A$	Trigonometry of Right Triangles.
If A and B are two acute angles in a right triangle, then $\frac{\csc A}{\csc B}$ A) $\tan B$ B) $\sin B$ C) $\cos B$ D) $\cot B$ E) 1	Trigonometry of Right Triangles.

If $\tan\theta = -\frac{4}{5}$ and $\sin\theta < 0$, then $\sec\theta - \csc\theta =$ A) $\frac{9\sqrt{41}}{20}$ B) $-\frac{9\sqrt{41}}{20}$ C) $\frac{\sqrt{41}}{20}$ D) $-\frac{\sqrt{41}}{20}$ E) $\frac{9\sqrt{41}}{41}$	Trigonometry of Right Triangles.
Let θ be an acute angle satisfying the equation $3\sin\theta = 4\cos\theta$, then $\csc\theta - \sec\theta =$ A) $\frac{5}{4}$ B) $-\frac{1}{5}$ c) $\frac{5}{12}$ D) $\frac{1}{5}$ E) $-\frac{5}{12}$	Trigonometry of Right Triangles.
If from the top of a tower $120\sqrt{3}$ feet high, the angles of depression to the top and bottom of a building opposite to the tower are observed to be 30° and 60° respectively, then the height of the building is (a) $80\sqrt{3}$ feet (b) $60\sqrt{3}$ feet (c) $120\sqrt{3}$ feet (d) $240\sqrt{3}$ feet (e) $40\sqrt{3}$ feet	Trigonometry of Right Triangles.