Trigonometry Apps
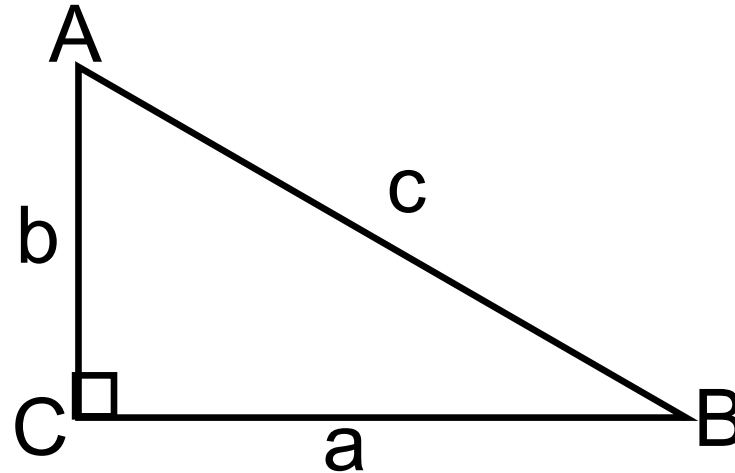
warm-up on a notecard...

Find all missing sides & angles.

$b = 3.5$

$m < A = 72^o$

Trigonometry Apps

Essential Question:

how do i find missing side lengths and angles using trigonometry?

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Solving Right Triangles

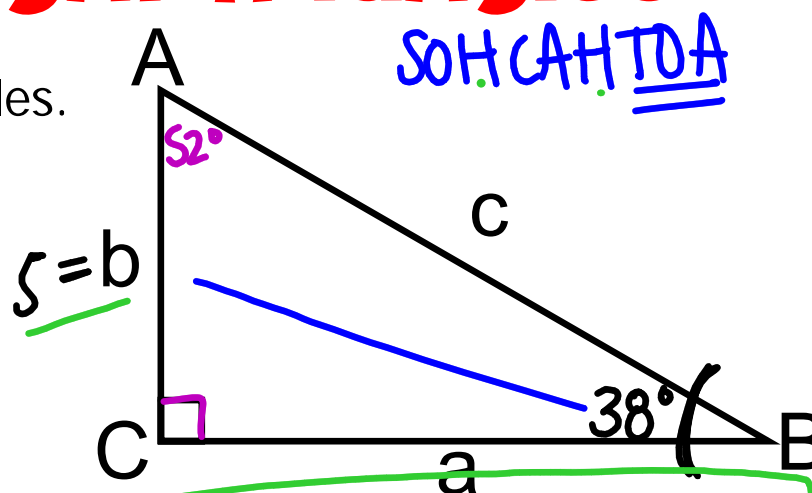Find all missing sides & angles.

SOH CAH TOA

1. b = 5

m<B = 38°

$$\tan 38 = \frac{5}{a}$$

$$\frac{a\tan 38}{\tan 38} = \frac{5}{\tan 38}$$

$$a \approx 6.400$$

$$\sin 38 = \frac{5}{c}$$

$$c = \frac{5}{\sin 38} \approx 8.121$$

A

52°

5 = b

c

C   a   38°   B

a = 6.400   c = 8.121

m∠A = 52°   m∠C = 90°

180-90-38

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Essential Question:

how do i find missing side lengths and angles using trigonometry?

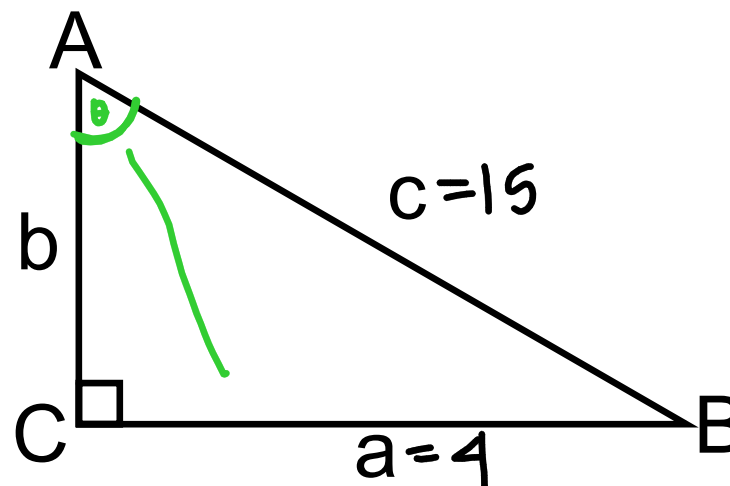## Solving Right Triangles

Find all missing sides & angles.

2. a = 4

 c = 15

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

$4^2 + b^2 = 15^2$

$\sqrt{b^2} = \sqrt{209}$

$b \approx 14.456$

$\sin A = \frac{4}{15}$
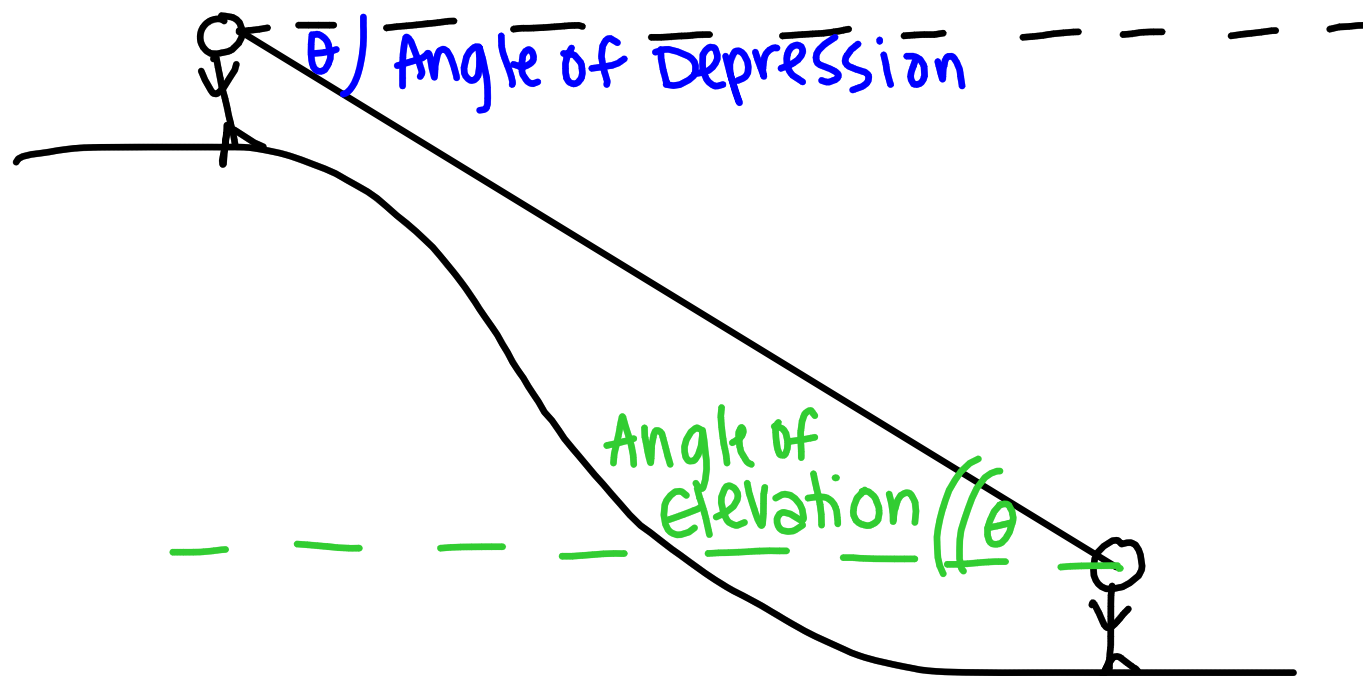
$A = \sin^{-1}\left(\frac{4}{15}\right) \approx 15.466°$

A

θ

b

c = 15

C

B

a = 4

b = 14.456

m∠A = 15.466° m∠B = 75° m∠C = 90°

180 − 90 − 15.466

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Essential Question:

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Angle of Elevation/Depression

θ) Angle of Depression

Angle of elevation (θ

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Essential Question:

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Angle of Elevation/Depression

ex3. A bird sits on top of a lamppost. The angle of depression from the bird to the feet of an observer standing 25m away is 35°. How tall is the lamppost?

Angle of Dep.

$$\tan 35 = \frac{x}{25}$$

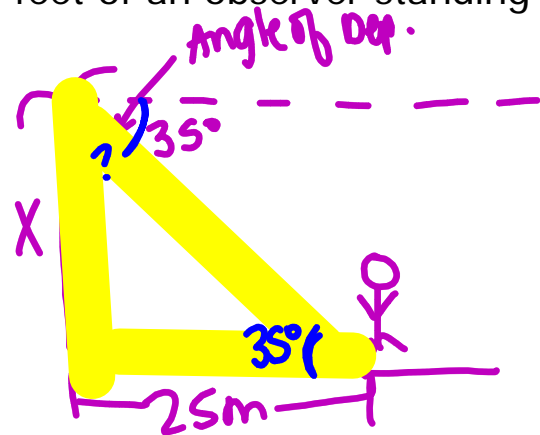$$25 \cdot \tan 35 \approx \boxed{17.505m}$$
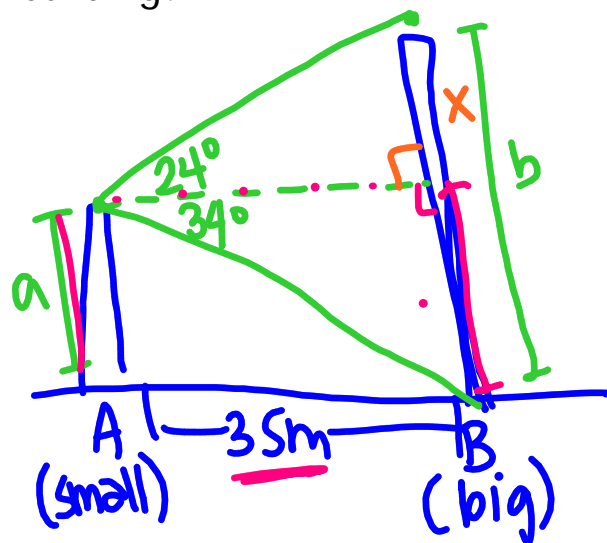
35°

? 35°

x

35°

25m

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Essential Question:

how do i find missing side lengths and angles using trigonometry?

Angle of Elevation/Depression

ex4. Buildings A and B are across the street from each other, 35m apart. From a point on the roof of Building A the angle of elevation of the top of Building B is 24°, and the angle of depression of the base of Building B is 34°. How tall is each building?

dep.

$\tan 34 = \dfrac{a}{35}$

$35 \tan 34 = a$

$a \approx 23.607m$

ele.

$\tan 24 = \dfrac{x}{35}$

$15.583m$

LAST STEP:
$a + x = b$

$23.607 + 15.583$

$b = 39.19m$

Trigonometry Apps

Essential Question:

How do I find missing side lengths and angles using trigonometry?

For video notes grades…

You will receive a 7/10 for completing the notes.

You must have a completed summary & at least one level 2 or 3 question in your cue column before class starts in order to receive a 10/10

LEVELS OF QUESTIONING

| Level 1	Level 2	Level 3
GOAL: MEMORIZE	**GOAL: UNDERSTAND**	**GOAL: APPLY**
"What is…?"	"How are…?"	"What if…?" "Why…?"
• define • list • evaluate • recall • identify • observe • describe • name	• analyze • compare • contrast • group • sort • infer • sequence • synthesize	• predict • if/then • hypothesize • speculate • imagine • infer

Name:_____

Right Triangle Applications

Solve each triangle (find all missing sides and missing angles). Round side measures to the nearest thousandth and angle measures to the nearest degree.

1. $c = 10$
   $m < B = 50°$

2. $a = 4$
   $c = 7$

3. $b = 3.5$
   $m < A = 72°$
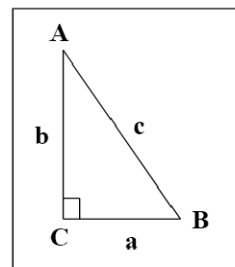
Draw a picture and solve the problem. Round all side measures to three decimal places and all angles measures to the nearest degree

4. A 24 foot ladder leaning against a wall makes a $75°$ angle with the ground.
   a. How high up the wall does the ladder reach?
   b. How far is the base of the ladder from the wall?

5. A plane passes directly over your head an altitude of 500 feet. Two seconds later you observe that its angle of elevation is $42°$
   a.) How far did the plane travel during those two seconds.
   b.) How fast is the plane traveling in **miles per hour**?

6. From a window 35 meters high, the angle of depression to the top of a nearby streetlight is $55°$. The angle of depression to the base of the streetlight is $61°$. How tall is the streetlight?

Draw a diagram and solve each problem. Round all side measures to three decimal places and all angle measures to the nearest degree.

7. Your cat Fuzzy is trapped in tree 8.2 meters above the ground. Your ladder is only 8.7 meters long. If you place the ladder's tip right next to Fuzzy, what angle will the ladder make with the ground?

8. A rocket shoots straight up from a launch pad. Five seconds after lift-off, Billy, who is standing 2 miles away, notes that the rocket's angle of elevation is $4.6°$. Four seconds after that, the angle of elevation is $38°$. How far did the rocket rise during those four seconds?

9. A man in a forest stands 20 feet from a huge pine tree. The angle of elevation from eye level to the top of the tree is $36°$, and the angle of depression to the base of the tree is $11°$. How tall is the tree?

10. A beam of gamma rays is to be used to treat a tumor known to be 5.7 cm beneath the patient's skin. To avoid damaging a vital organ, the radiologist moves the radiation source over 8.3 cm.
     a.) At what angle to the patient's skin must the radiologist aim the gamma ray source to hit the tumor?
     b.) How far will the beam have to travel through the patient's body before reaching the tumor?
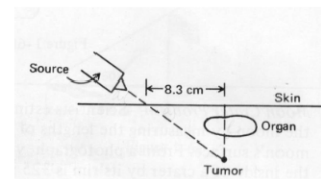
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1. a = 6.438   b = 7.660   m<A =40

2. b = 5.745   m<A = 35   m<B = 55

3. a = 10.772   b = 1.082   m<B =18

4. a. 23.182ft   b. 6.211 ft

5. a. 555.306ft   b. 189.309mph

6. 7.29m

7. 70

8. 1.402mi

9. 18.419ft

10. a. 34   b. 10.069cm