Lesson 8-5: Applications of Trig Ratios

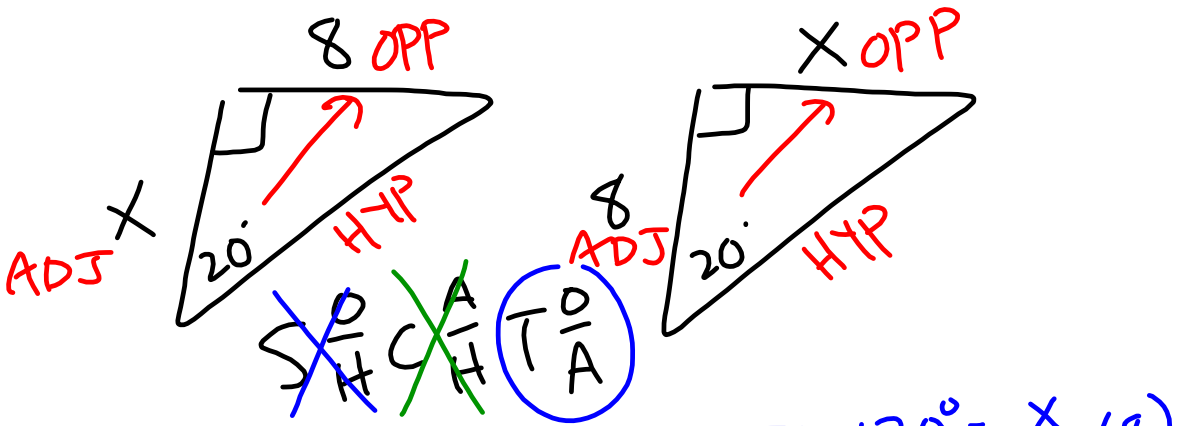
AGENDA: 8.5

- Check HW 8.4
- Notes 8.5 with Applications and Guided Practice

HOMEWORK:8-5

- Worksheet 8-5

CR#7 is Due Wednesday



$\tan 20° = \frac{8}{x}$

$x(\tan 20°) = 8$

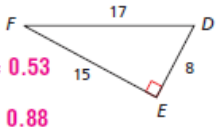
$x = \frac{8}{\tan 20°}$

(8) $\tan 20° = \frac{x}{8}$ (8)

$8(\tan 20°) = x$

PRACTICE AND PROBLEM SOLVING

Write each trigonometric ratio as a fraction and as a decimal rounded to the nearest hundredth.



22. $\cos D$ $\frac{8}{17} \approx 0.47$ 23. $\tan D$ $\frac{15}{8} \approx 1.88$ 24. $\tan F$ $\frac{8}{15} \approx 0.53$

25. $\cos F$ $\frac{15}{17} \approx 0.88$ 26. $\sin F$ $\frac{8}{17} \approx 0.47$ 27. $\sin D$ $\frac{15}{17} \approx 0.88$

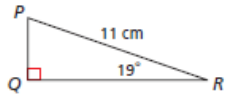
Use your calculator to find each trigonometric ratio. Round to the nearest hundredth.

31. $\tan 51°$ 1.23 32. $\sin 80°$ 0.98 33. $\cos 77°$ 0.22

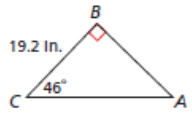
34. $\tan 14°$ 0.25 35. $\sin 55°$ 0.82 36. $\cos 48°$ 0.67

Find each length. Round to the nearest hundredth.

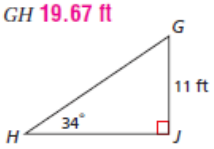
37. PQ 3.58 cm



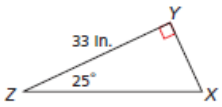
38. AC 27.64 in.



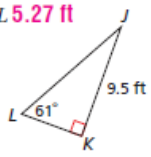
39. GH 19.67 ft



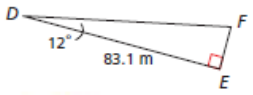
40. XZ 36.41 in.



41. KL 5.27 ft

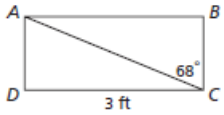


42. EF 17.66 m



Find the indicated length in each rectangle.

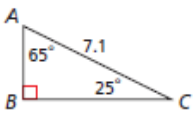
49. BC 1.2 ft



68. Which expression can be used to find AB?

(A) $7.1(\sin 25°)$ (C) $7.1(\sin 65°)$

(B) $7.1(\cos 25°)$ (D) $7.1(\tan 65°)$



Homework
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Geometry + LAB Name _____ Section _____ Date_____

8-5 Notes: Using Trigonometric Ratios

1. Match the following.

a) 5 Opposite Leg to ∠A

b) 8 Sine Ratio of ∠C

c) 3 Opposite Angle to $\overline{AB}$

d) 6 The Hypotenuse

e) 4 Adjacent Leg to ∠A

f) 10 Tangent Ratio of ∠C

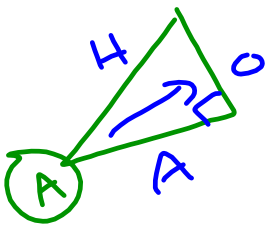
g) 3 Reference angle if $\frac{BC}{AC}$ is the Cosine Ratio.

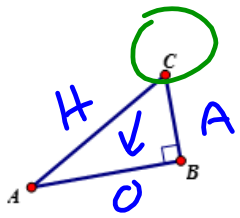
h) 5 Adjacent Leg to ∠C

i) 8 Cosine Ratio of ∠A

j) 6 The Longest Side

k) 1 Reference angle if $\frac{BC}{AC}$ is the Sine Ratio.





1. ∠A
2. ∠B
3. ∠C
4. $\overline{AB}$
5. $\overline{BC}$
6. $\overline{AC}$
7. $\frac{BC}{AC}$
8. $\frac{AB}{AC}$
9. $\frac{BC}{AB}$
10. $\frac{AB}{BC}$

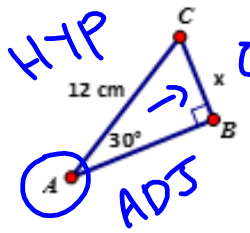
2. Label the sides of the triangle using the reference angle -- (O) for Opposite, (A) for Adjacent and (H) for Hypotenuse. After you have labeled the triangle, solve for the missing side. Round to the nearest tenth.

SOH CAH TOA

$\sin 30° = \frac{x}{12}$

$12(\sin 30°) = x$

a)

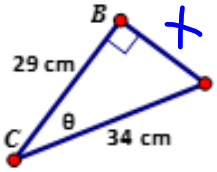


HYP OPP ADJ

6.0 cm

θ = ANGLE

b)



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

$29^2 + x^2 = 34^2$

$x^2 = 315$

$x = \pm\sqrt{315}$

AB = 17.7 cm

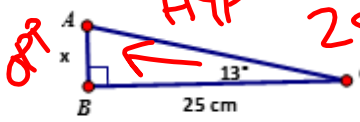
2. Label the sides of the triangle using the reference angle -- (O) for Opposite, (A) for Adjacent and (H) for Hypotenuse. After you have labeled the triangle, solve for the missing side. Round to the nearest tenth.

SOH ~~CAH~~ TOA

$\tan 13° = \frac{x}{25}$

$25(\tan 13°) = x$

c)



HYP ADJ

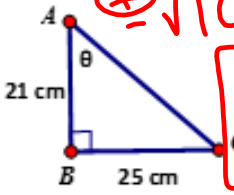
5.8 cm

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

$21^2 + 25^2 = c^2$

$\pm\sqrt{1066} = c$

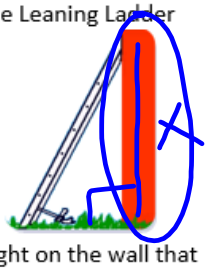
d)



32.6 cm = AC

3. Circle (or Draw) the side or angle that is represented by the description.

a) The Leaning Ladder

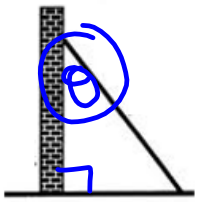


Height on the wall that the ladder reaches.

b) The Leaning Ladder

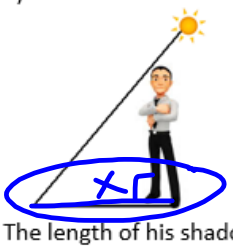
The distance from the foot of the ladder to the wall.

c) The Leaning Ladder



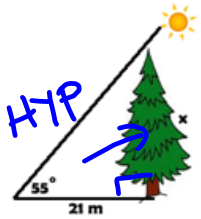
The angle the ladder forms with the wall.

d) The Shadow



The length of his shadow.

4) The shadow cast by the tree measures 21 meters. Find the height of the tree to the nearest tenth of a meter.



$SOH\,CAH\,TOA$

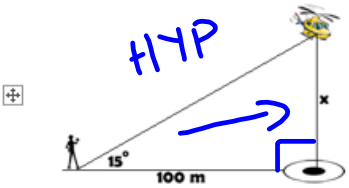
$\tan 55^\circ = \frac{x}{21}$

$21(\tan 55^\circ) = x$

$29.9911\ldots = x$

30.0 m = HEIGHT

5) A helicopter is hovering over a landing pad 100 m from where you are standing. The helicopter's angle of elevation with the ground is 15°. What is the altitude of the helicopter to the nearest meter?



HYP
OPP
ADJ

SOH CAH TOA

$\tan 15^\circ = \frac{x}{100}$

$100(\tan 15^\circ) = x$

$26.7949... = x$

27 m ALTITUDE

6) A drawbridge that spans 113 feet across a river is raised up to let boats pass.

A) When the bridge is raised 60°, find the height of the drawbridge from the river, to the nearest foot.

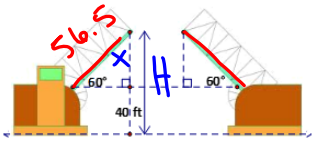
÷2 = 56.5

SOH CAH TOA

$\sin 60^\circ = \frac{x}{56.5}$

$56.5(\sin 60^\circ) = x$

$48.9304... = x$



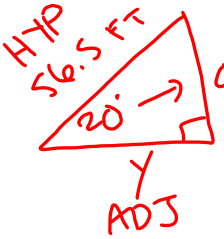
$H = 40 + x$ FT

$= 40 + 48.9304$

$= 88.9304$

$= 89$ FT

B) When the bridge is lowered down to 20°, find the distance between the two halves of the drawbridge to the nearest tenth.

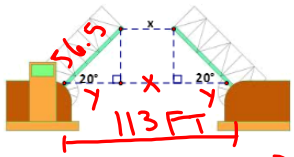


SOH CAH TOA

$\cos 20^\circ = \frac{y}{56.5}$

$56.5(\cos 20^\circ) = y$

$53.0926... = y$



$y + x + y = 113$

$x + 2y = 113$

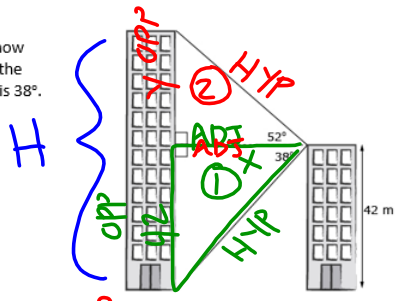
$x = 113 - 2y$

$x = 113 - 2(53.092)$

$= 6.8147$

6.8 FT

7) Standing on top of a 42 meter building, an observer wants to know the height of the high rise next door. The angle of elevation to the top is 52° and the angle of depression to the street level below is 38°. How tall is the high rise, to the nearest meter?



$H = 42 + Y$

① SOH CAH TOA

$\tan 38° = \frac{42}{x}$

$x(\tan 38°) = 42$

$x = \frac{42}{\tan 38°}$

$53.7575....$

② SOH CAH TOA

$\tan 52° = \frac{y}{53.7575}$

$53.7575(\tan 52°) = y$

$68.8064.... = y$

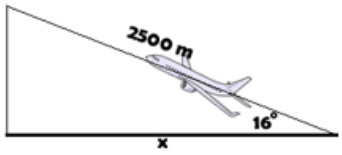
$H = 42 + 68.8064$

$= 110.8064$

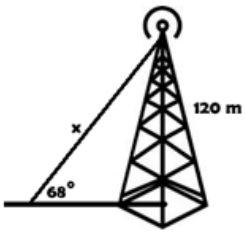
$= \boxed{111\text{ m}}$

PROBLEM SET 8-5 Geometry + LAB

1) An airplane climbs at an angle of 16° with the ground. Find the ground distance the plane travels as it moves 2500 m through the air to the nearest meter.



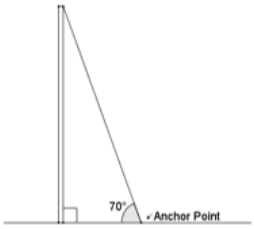
2) A guy wire reaches from the top of a 120 m television transmitter tower to the ground. The wire makes a 68° angle with the ground. Find the length of the guy wire to the nearest tenth of a meter.



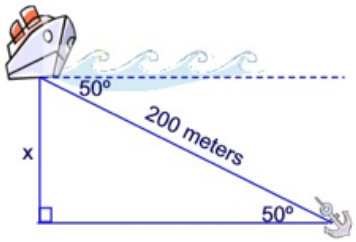
3) Draw a diagram and solve the following: A man casts a 3 ft long shadow. If the sun's rays strike the ground at an angle of 62°, what is the height of the man to the nearest tenth of a foot?

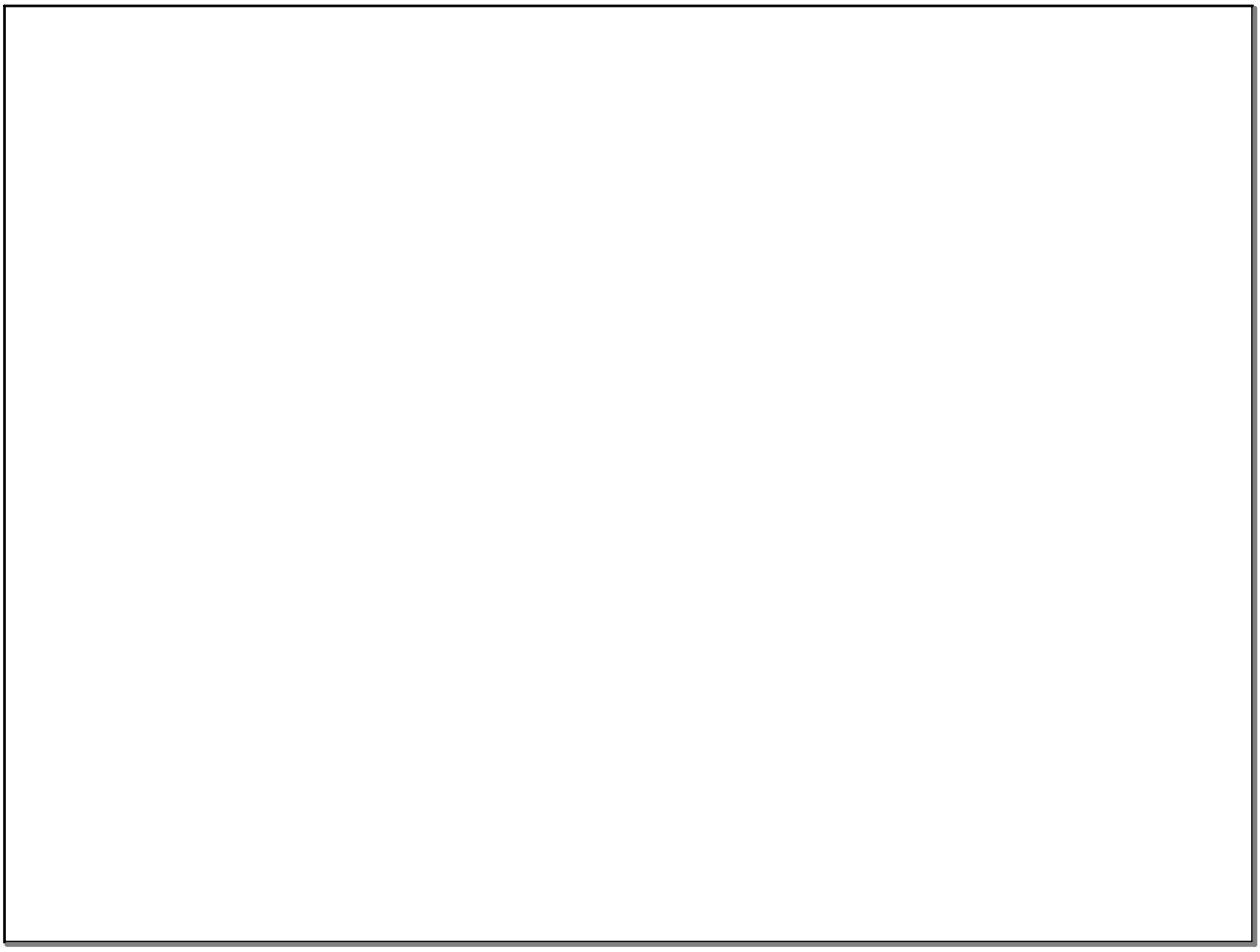
4) A kite with a string 150 feet long makes an angle of 45° with the ground. What is the height of the kite to the nearest tenth of a foot? Be sure to draw a diagram first.

5) (Module 2 Lesson 25): A cable anchors a utility pole to the ground as shown in the picture. The cable forms an angle of 70° with the ground. The distance from the base of the utility pole to the anchor point on the ground is 3.8 meters. Approximately how many meters will be needed to replace the support cable? (Answer to the nearest tenth).



6) A ship drops an anchor at an angle of depression of 50° and waits for it to sink to the bottom of the ocean. Knowing that 200 meters of line have been uncoiled, how deep is the ocean beneath the ship?





Attachments

Bridge to 8.docx