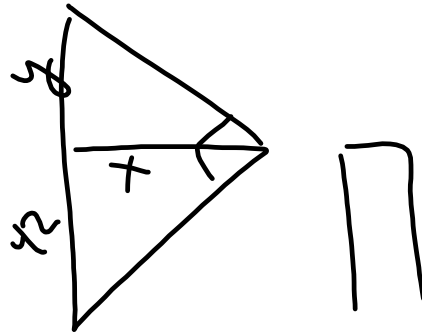


Lesson 8-9 : Double Trig

Agenda - Check HW 8-8
Notes 8-9

HW - 8-9

Quiz - Next Class



GEOMETRY Name: _____ Section: _____ Date: _____

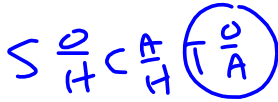
8-9 REG + 8-11 LAB Double Trig Problems

Sometimes you need to use more than one right triangle and the segment addition postulate to solve a problem. Remember, you must be working with a RIGHT triangle to use trig!

1. Label the needed lengths/dimensions with variables
2. If segment addition/subtraction will be needed, write the equation
3. Draw the right triangles you will need
4. Set up the appropriate trig ratio equations and solve them – carry at least 4 decimal places or the trig function
5. Plug lengths/dimensions into any segment addition equation if applicable
6. Round at the very end!

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Comparing Heights

Two trees are 100 m apart. From the exact middle between them, the angles of elevation of their tops are 12° and 16° . How much taller is one tree than the other (2 decimal places)?

TALL

$\tan 16^\circ = \frac{x}{50}$

$50(\tan 16^\circ) = x$

$14.3372\dots = x$

$\tan 12^\circ = \frac{y}{50}$

$50(\tan 12^\circ) = y$

$10.6278\dots = y$

DIFF = $x - y$

$= 14.3372 - 10.6278$

$= 3.7094$

$= \boxed{3.71\text{m}}$ TALLER

COMPARE

$x \neq y$

$x - y =$ DIFF

Adding Lengths (Segment Addition)

LET X = HEIGHT OF TREE

A farmer standing in his hay loft 30 feet from a tree can see a bird (B) at an angle of elevation of 20° and a dog (C) at an angle of depression of 32° . Is the tree taller than his 24 foot tall barn?

TOP TO A

$\tan 20^\circ = \frac{y}{30}$

$30(\tan 20^\circ) = y$

$10.9191\dots \text{ FT} = y$

$\tan 32^\circ = \frac{z}{30}$

$30(\tan 32^\circ) = z$

$18.7460\dots = z$

$X = z + y$

$X = 18.7460$

$+ 10.9191$

29.6651

29.7 FT

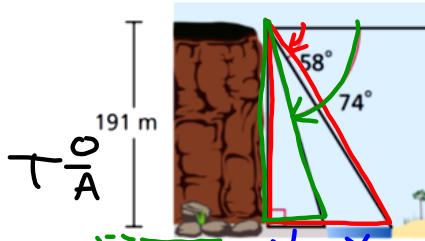
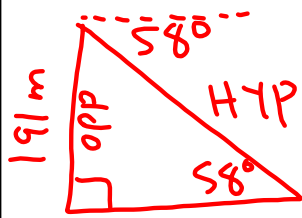
$= \text{ TREE}$

> 24

YES, TREE IS TALLER

Indirect Measurement (Segment Subtraction)

Example 1: From the top of the canyon, the angle of depression to the far side of the river is 58° , and the angle of depression to the near side of the river is 74° . The depth of the canyon is 191 m. What is the width of the river, to the nearest tenth of a meter, at the bottom of the canyon?



LET X

$$X + Y = Z$$

$$X = Z - Y$$

$$X = 119.3500 - 54.7683$$

$$X = 64.5817$$

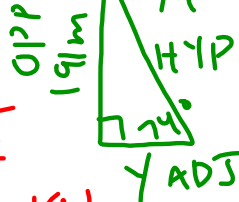
$$\approx \boxed{64.6 \text{ m}}$$

Z
ADJ
 $TAN 58^\circ = \frac{191}{Z}$

$$Z(TAN 58^\circ) = 191$$

$$Z = \frac{191}{TAN 58^\circ}$$

$$Z = 119.3500\dots$$



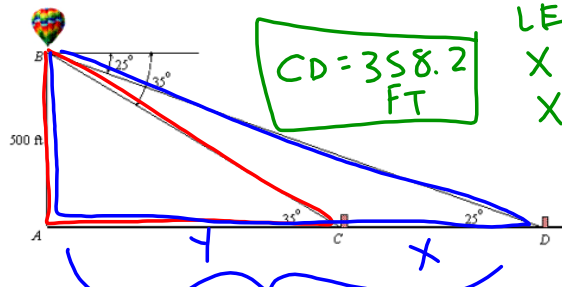
$$TAN 74^\circ = \frac{191}{Y}$$

$$Y(TAN 74^\circ) = 191$$

$$Y = \frac{191}{TAN 74^\circ}$$

$$Y = 54.7683\dots$$

Example 2: A hot air balloon is flying at an altitude of 500 ft. The angle of depression to a landmark at D is 25° , and the angle of depression to a landmark located at C is 35° . Find the distance between the landmarks.



$CD = 358.2 \text{ FT}$

LET DIST $CD = X$

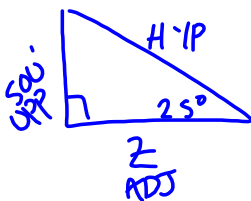
$$X + Y = Z$$

$$X = Z - Y$$

$$= 1072.2534$$

$$- 714.0740$$

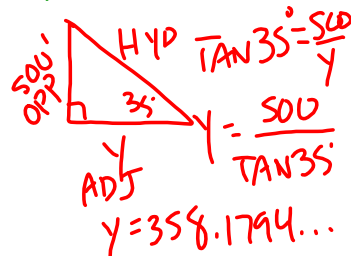
$$X = 358.1794\dots$$



$$TAN 25^\circ = \frac{500}{Z}$$

$$Z = \frac{500}{TAN 25^\circ}$$

$$Z = 1072.2534$$



$$TAN 35^\circ = \frac{500}{Y}$$

$$Y = \frac{500}{TAN 35^\circ}$$

$$Y = 714.0740\dots$$

Attachments

Bridge to 8.docx

Quiz 1 L.pdf