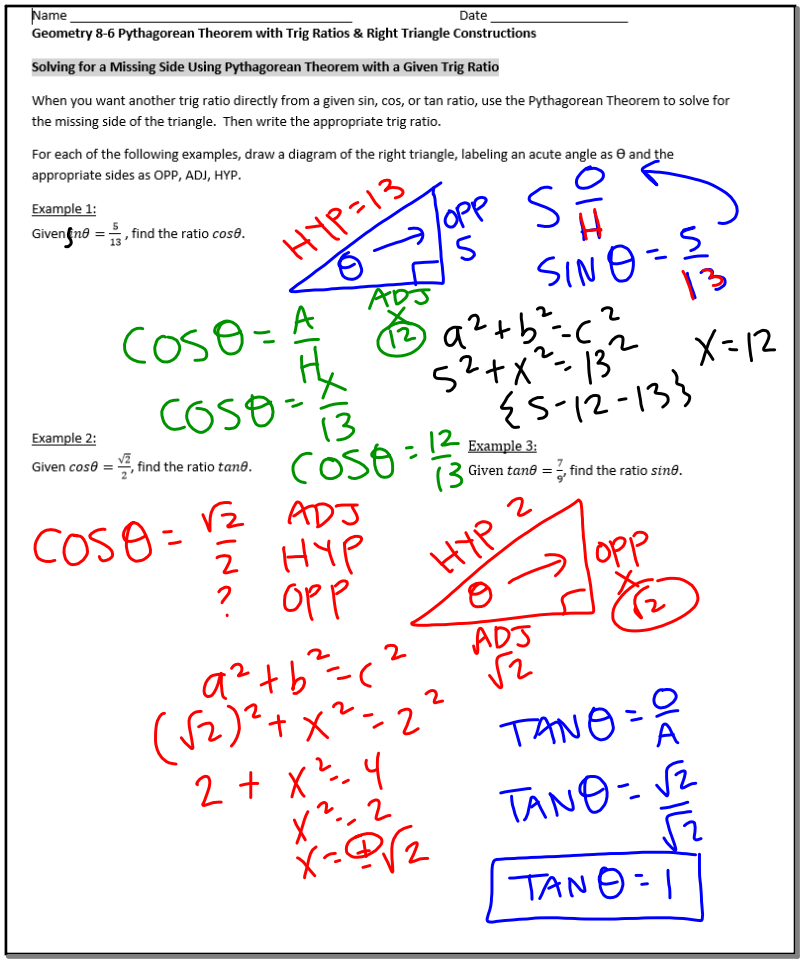
Lesson 8-6: Pythag Thm. w/Trig Ratios and Right triAngle Constructions

AGENDA:

- Check HW 8-5
- Notes 8.6 with Applications and Guided Practice

HOMEWORK:8-6

- Worksheet 8-6
- Cumulative Review



Name _____ Date _____

Geometry 8-6 Pythagorean Theorem with Trig Ratios & Right Triangle Constructions

Solving for a Missing Side Using Pythagorean Theorem with a Given Trig Ratio

When you want another trig ratio directly from a given sin, cos, or tan ratio, use the Pythagorean Theorem to solve for the missing side of the triangle. Then write the appropriate trig ratio.

For each of the following examples, draw a diagram of the right triangle, labeling an acute angle as θ and the appropriate sides as OPP, ADJ, HYP.

Example 1:

Given $\sin\theta = \frac{5}{13}$, find the ratio $\cos\theta$.

HYP = 13, OPP = 5, θ, ADJ = X = 12

SOH

$\sin\theta = \frac{5}{13}$

$\cos\theta = \frac{A}{H}$

$\cos\theta = \frac{x}{13}$

$\cos\theta = \frac{12}{13}$

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

$5^2 + x^2 = 13^2$

$x = 12$

{5-12-13}

Example 2:

Given $\cos\theta = \frac{\sqrt{2}}{2}$, find the ratio $\tan\theta$.

$\cos\theta = \frac{\sqrt{2}}{2}$ ADJ / HYP / ? OPP

HYP 2, θ, OPP X = √2, ADJ √2

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

$(\sqrt{2})^2 + x^2 = 2^2$

$2 + x^2 = 4$

$x^2 = 2$

$x = \pm\sqrt{2}$

TOA

$\tan\theta = \frac{O}{A}$

$\tan\theta = \frac{\sqrt{2}}{\sqrt{2}}$

$\tan\theta = 1$

Example 3:

Given $\tan\theta = \frac{7}{9}$, find the ratio $\sin\theta$.

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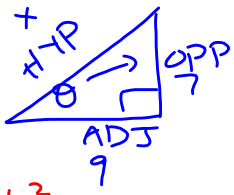
For each of the following examples, draw a diagram of the right triangle, labeling an acute angle as Θ and the appropriate sides as OPP, ADJ, HYP.

Example 1:

Given $\sin\theta = \frac{5}{13}$, find the ratio $\cos\theta$.

Example 2:

Given $\cos\theta = \frac{\sqrt{2}}{2}$, find the ratio $\tan\theta$.



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

$7^2+9^2=c^2$

$49+81=c^2$

$\sqrt{130}=\sqrt{c^2}$

$c=\sqrt{130}=HYP$

Example 3:

Given $\tan\theta = \frac{7}{9}$, find the ratio $\sin\theta$.

$\tan\theta = \frac{7}{9} = \frac{OPP}{ADJ}$

$x = HYP$

$\sin\theta = \frac{O}{H}$

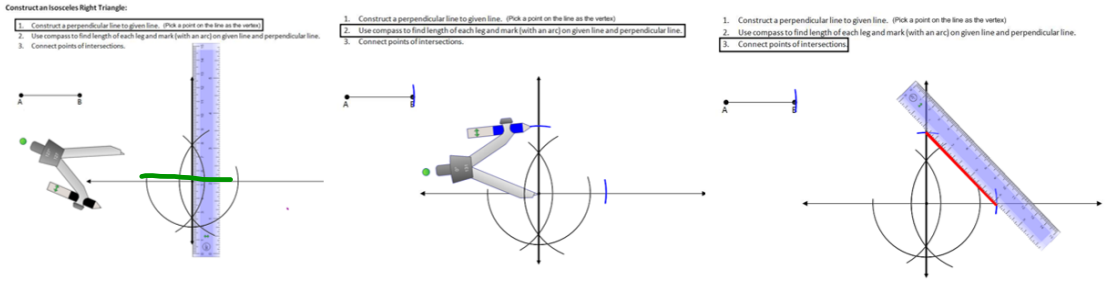
$\sin\theta = \frac{7}{\sqrt{130}}$

$\sin\theta = \frac{7}{\sqrt{130}}\left(\frac{\sqrt{130}}{\sqrt{130}}\right)$

$\sin\theta = \frac{7\sqrt{130}}{130}$

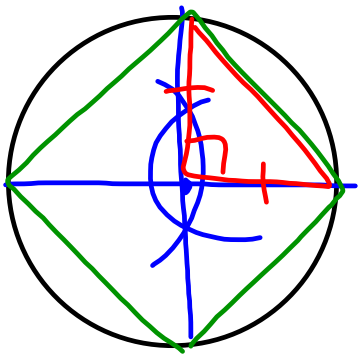
Geometry 8-7 LAB Notes: Right Triangle Constructions Name _____ Date _____

Constructions of Right Triangles Video Resource: http://www.mathopenref.com/consttrianglell.html



Construct an Isosceles Right Triangle:

1. Construct a perpendicular line to given line. Pick a point on the line as the vertex of the triangle.
2. Use compass to find length of each leg and mark (with an arc) on given line and perpendicular line.
3. Connect points of intersections.



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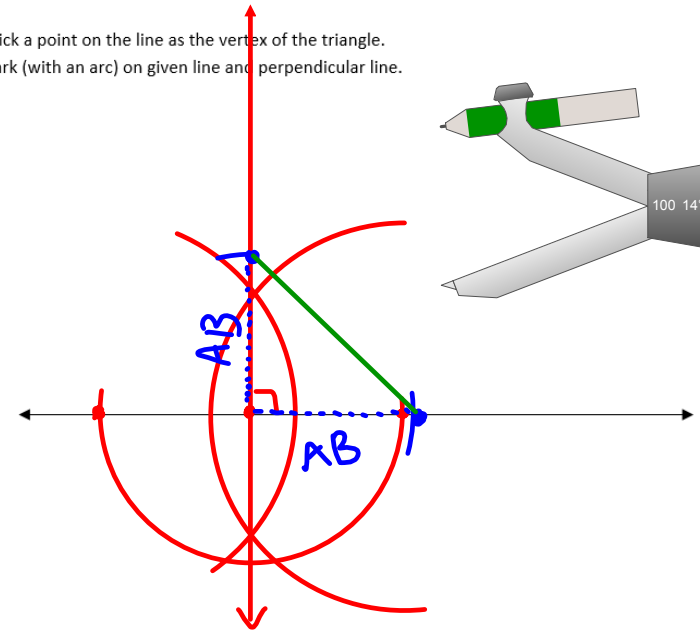
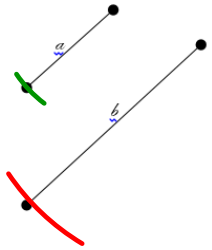
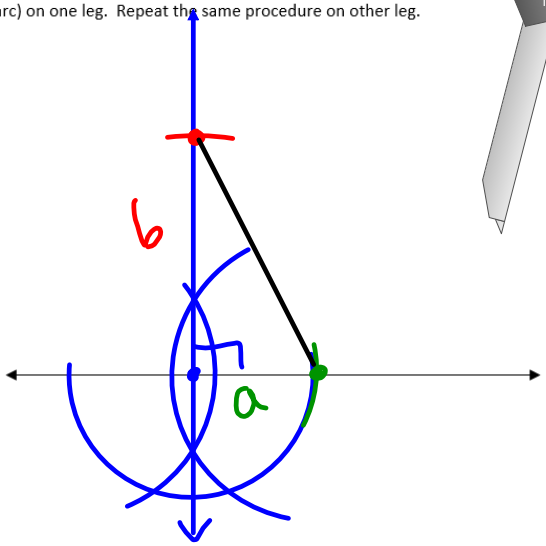
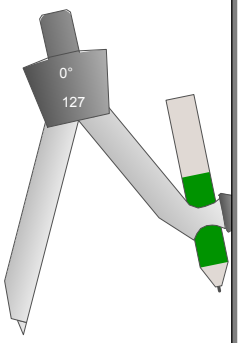


Construct a Scalene Right Triangle:

1. Construct a line perpendicular to the given line. Pick a point on the line as the vertex of the triangle.
2. Use compass to measure length of each leg, mark (with an arc) on one leg. Repeat the same procedure on other leg.
3. Connect points of intersection.







Attachments

Bridge to 8.docx