Today's Plan:

Learning Target (standard): I will find the area of oblique triangles.

Students will: Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

Teacher will: Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

Assessment: Board work, homework check and homework assignment

Differentiation: Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.

p.546 #26,28,30,32,34

$26a) 227.56 miles$

$b) 149.7^\circ$

$28a) 26.4^\circ$

$b) 40.8 hours$

$30a) 42.6\,ft$

$b) 38.6\,feet$

$c) 85.1^\circ$

$32) b \approx 501.28\,ft$

$a \approx 518.4\,ft$

$34) 241.33\,ft$

Tuesday - TEST on Triangles

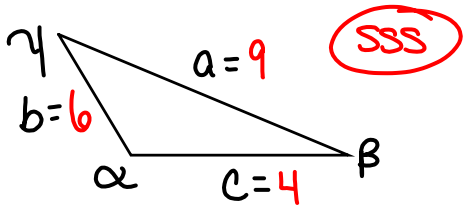
Wednesday - Application TEST

Solve the triangle:

$a = 9$

$b = 6$

$c = 4$



SSS

$a^2 = b^2 + c^2 - 2bc\cos\alpha$

$9^2 = 6^2 + 4^2 - 2(6)(4)\cos\alpha$

$81 = 36 + 16 - 48\cos\alpha$

$29 = -48\cos\alpha$

$\cos\alpha = -.6042$

$\alpha = 127.169°$

$b^2 = a^2 + c^2 - 2ac\cos\beta$

$6^2 = 9^2 + 4^2 - 2(9)(4)\cos\beta$

$36 = 81 + 16 - 72\cos\beta$

$-61 = -72\cos\beta$

$\cos\beta = 0.8472$

$\beta = 32.089°$

$\gamma = 180° - 127.169° - 32.089°$

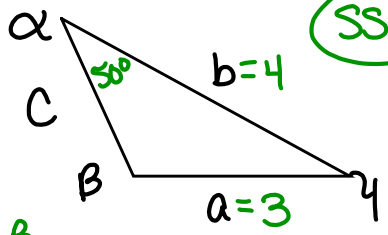
$\gamma = 20.742°$

Solve the triangle:

$a = 3$

$b = 4$

$\alpha = 50°$



SSA

$\frac{\sin\alpha}{a} = \frac{\sin\beta}{b}$

$\frac{\sin 50°}{3} = \frac{\sin\beta}{4}$

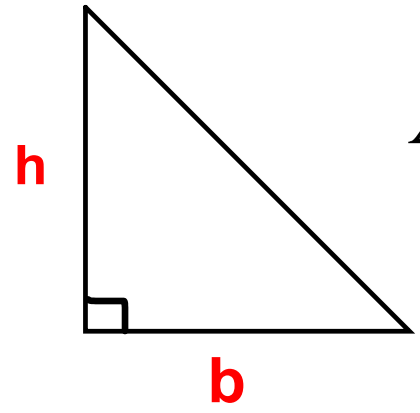
$3\sin\beta = 4\sin 50°$

$\sin\beta = \frac{4\sin 50°}{3}$

$\sin\beta = 1.0214 > 1$

no triangle

Area of triangles:

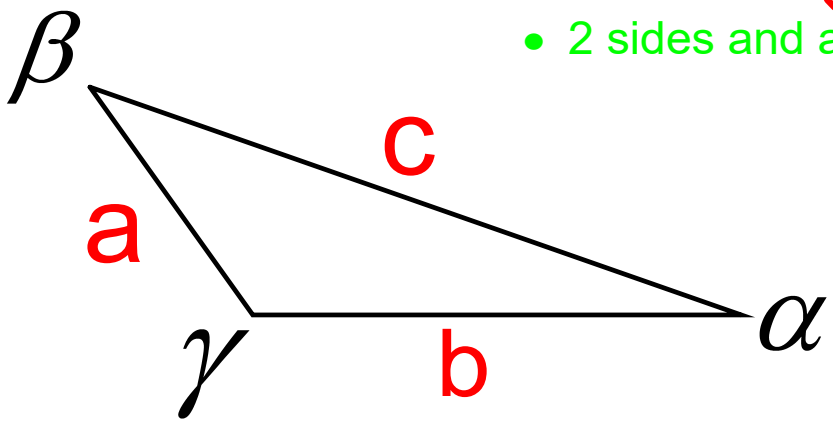


$$A = \frac{1}{2}bh$$

Area of oblique triangles:

SAS

- 2 sides and an included angle



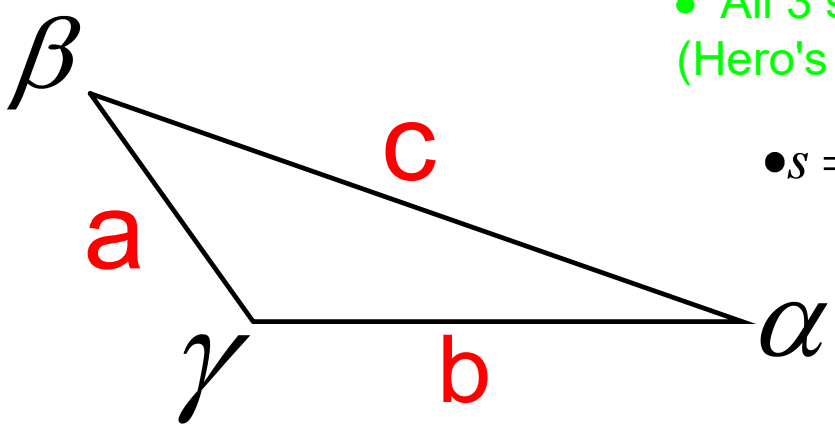
- $\frac{1}{2}ab\sin\gamma$
- $\frac{1}{2}bc\sin\alpha$
- $\frac{1}{2}ac\sin\beta$

Area of oblique triangles:

SSS

- All 3 sides (Hero's Formula)

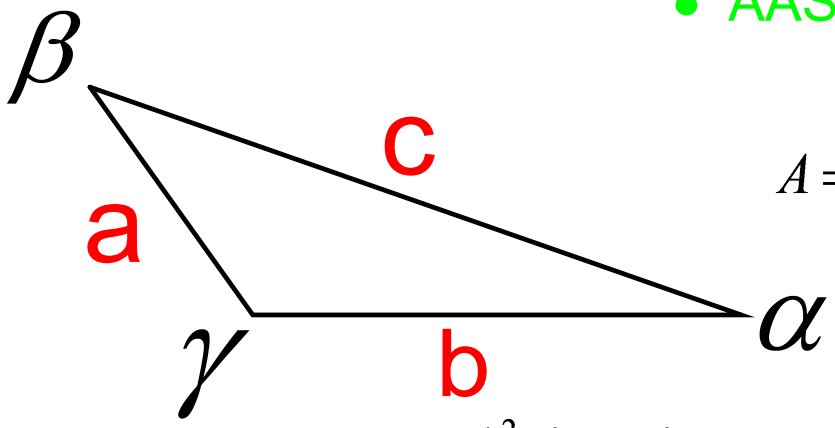
$$s = \frac{1}{2}(a+b+c)$$



$$A = \sqrt{s(s-a)(s-b)(s-c)}$$

Area of oblique triangles:

- AAS condition



$$A = \frac{a^2 \sin\beta \sin\gamma}{2\sin\alpha}$$

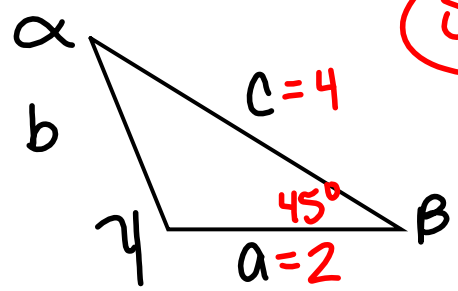
$$A = \frac{b^2 \sin\alpha \sin\gamma}{2\sin\beta} \qquad A = \frac{c^2 \sin\alpha \sin\beta}{2\sin\gamma}$$

Find the area of the triangle:

$a = 2$

$c = 4$

$\beta = 45°$



SAS

$A = \frac{1}{2} ac \sin\beta$

$A = \frac{1}{2}(2)(4)\sin 45^0$

$= 4(.7071)$

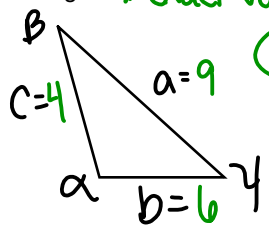
$A = 2.828\ u^2$

Find the area of the triangle: * exact value *

$a = 9$

$b = 6$

$c = 4$



SSS

$S = \frac{1}{2}(a+b+c)$

$= \frac{1}{2}(9+6+4)$

$S = \frac{19}{2}$

$A = \sqrt{S(S-a)(S-b)(S-c)}$

$= \sqrt{\frac{19}{2}\left(\frac{19}{2}-9\right)\left(\frac{19}{2}-6\right)\left(\frac{19}{2}-4\right)}$

$= \sqrt{\frac{19}{2}\left(\frac{1}{2}\right)\left(\frac{7}{2}\right)\left(\frac{11}{2}\right)}$

$= \sqrt{\frac{1463}{16}}$

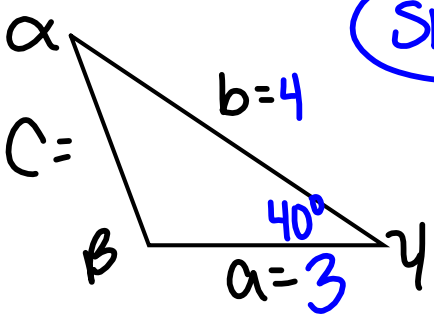
$A = \frac{\sqrt{1463}}{4}\ u^2$

Find the area of the triangle:

$a = 3$

$b = 4$

$\gamma = 40°$



SAS

$A = \frac{1}{2}ab\sin\gamma$

$= \frac{1}{2}(3)(4)\sin 40°$

$= 6(.6428)$

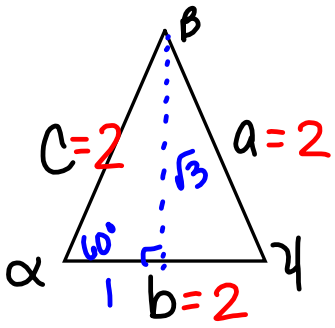
$A = 3.857\ u^2$

Find the area of the triangle:

$a = 2$

$b = 2$

$c = 2$



SSS

$A = \frac{1}{2}bh$

$= \frac{1}{2}(2)(\sqrt{3})$

$A = \sqrt{3}\ u^2$

$s = \frac{1}{2}(a+b+c)$

$= \frac{1}{2}(2+2+2)$

$= \frac{1}{2}(6)$

$s = 3$

$A = \sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{3(3-2)(3-2)(3-2)}$

$= \sqrt{3 \cdot 1 \cdot 1 \cdot 1}$

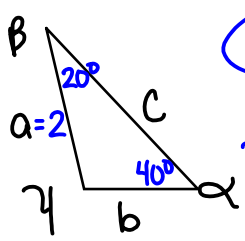
$A = \sqrt{3}\ u^2$

Find the area of the triangle:

$\alpha = 40°$

$\beta = 20°$

$a = 2$



AAS

$\gamma = 180° - 40° - 20°$

$\gamma = 120°$

$$A = \frac{a^2 \sin\beta \sin\gamma}{2\sin\alpha}$$

$$= \frac{2^2 \sin 20° \sin 120°}{2\sin 40°}$$

$$= \frac{4(.3420)(.8660)}{2(.6428)}$$

$$A = 0.922 u^2$$

Assignment:

p.552 #2-24 even, 34-40 even

* Draw ALL appropriate diagrams and write the formula used! *