Quiz tomorrow.

Warm-up

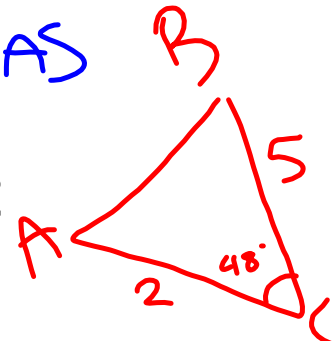
May 3, 2017

Wear clothes that you don't mind going outside Friday, May 5.

Solve the triangle. SAS

a = 5, C = 48°, b = 2

S A S



$c = \sqrt{5^2 + 2^2 - 2(5)(2) * \cos(48^\circ)}$

$c = 4.0$

$A = \cos^{-1}\left(\frac{2^2 + c^2 - 5^2}{2(2)(c)}\right)$

$A = 108.2$ or 109.91°

$B = \cos^{-1}\left(\frac{5^2 + c^2 - 2^2}{2(5)(c)}\right)$

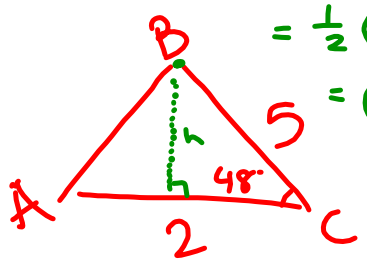
$B = 22.3$ or 22.09°

$$\text{Area} = \frac{1}{2}\begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}$$

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

$$= \frac{1}{2}(2)(3.72)$$

$$= 3.72 \text{ sq. units}$$



$5 \cdot \sin(48) = \frac{O}{H} = \frac{\text{height}}{5} \cdot 5$

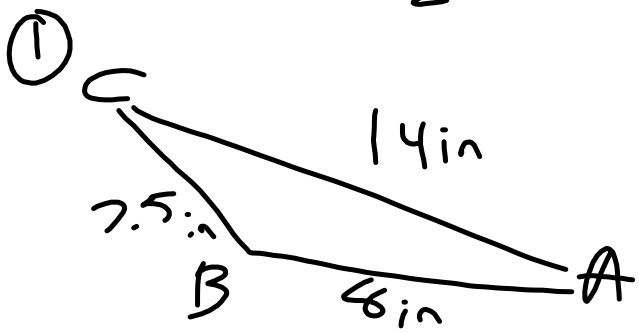
$\text{height} = 5 \cdot \sin(48)$

$= 3.72$

Heron's formula. SSS

② $\text{Area} = \sqrt{(s(s-a)(s-b)(s-c))}$

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



① $\frac{(7.5+14+8)}{2}$

$= 14.75$

② $\sqrt{(14.75(14.75-7.5)(14.75-14)(14.75-8))}$

$= 23.3 \text{ in}^2$

$$\text{Area} = \frac{1}{2}ba\sin C$$

SAS

$$= \frac{1}{2}ab\sin C$$

$$= \frac{1}{2}ac\sin B$$

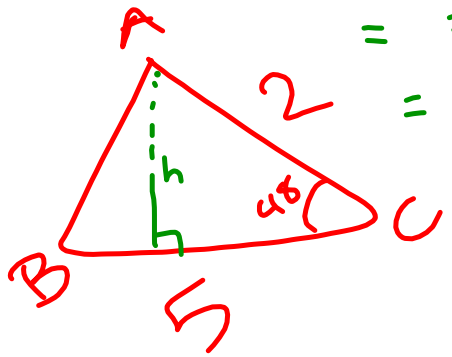
$$= \frac{1}{2}bc\sin A$$

$$\text{Area} = \frac{1}{2}\begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}$$

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

$$= \frac{1}{2}(5)(2 \cdot \sin(48^\circ))$$

$$= 3.71 \text{ sq. units}$$



$$2 \cdot \sin(48) = \frac{O}{H} = \frac{\text{height}}{2}$$

$$\text{height} = 2 \cdot \sin(48)$$

SAS Area $= \frac{1}{2}ab\sin C$

$\frac{1}{2}ac\sin B$

$\frac{1}{2}bc\sin A$

(1-5) SSS – Heron's Formula

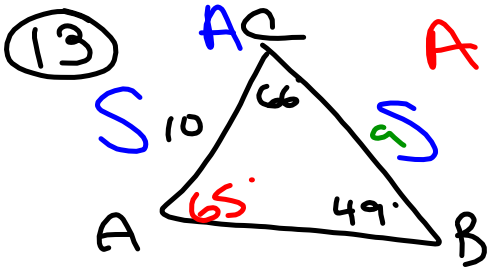
(6-10) SAS – trig
$A_\Delta = \frac{1}{2}ab\sin C$

(11-15) AAS → SAS
Law of Sines

(16-20) ASA → SAS
Law of Sines

(21-24) SSA → SAS or SSS
Law of Sines

(13)



AAS

$$\frac{\sin 65^\circ}{a} = \frac{\sin 49^\circ}{10} = \frac{\sin 66^\circ}{c}$$

$$\frac{\sin(65)}{a} = \frac{\sin(49)}{10}$$

$$\frac{10\sin(65)}{\sin(49)} = \frac{a\sin(49)}{\sin(49)}$$

$$a = 12.01 \text{ cm}$$

$$\text{Area} = \frac{1}{2}ab\sin C$$

$$= \frac{1}{2}(12.01)(10)\sin(66^\circ)$$

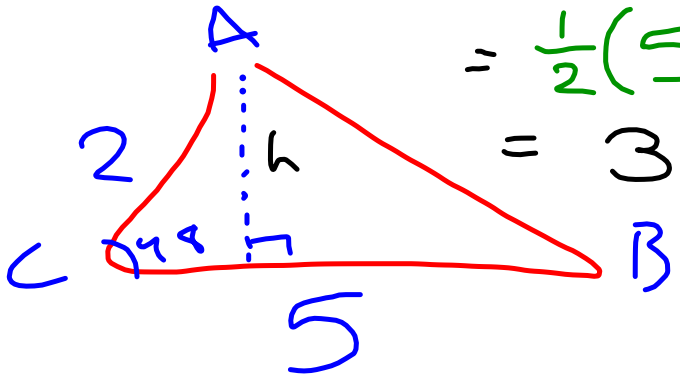
$$\approx 54.81 \text{ cm}^2$$

$$\text{Area} = \frac{1}{2}\begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}$$

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

$$= \frac{1}{2}(5)(1.48)$$

$$= 3.7 \text{ sq. units}$$



$$\sin C = \frac{\text{height}}{2}$$

$$2 \cdot \sin(48) = \frac{h}{2} \cdot 2$$

$$\text{height} = 1.48$$

SAS

$$\text{Area} = \frac{1}{2}ab\sin C$$

$$= \frac{1}{2}bc\sin A$$

$$= \frac{1}{2}ac\sin B$$

$$A = \cos^{-1}\left(\frac{2^2 + 4^2 - 5^2}{2(2)(4)}\right)$$

$$A = 108.2$$

$$B = 108 + 48 = 156$$

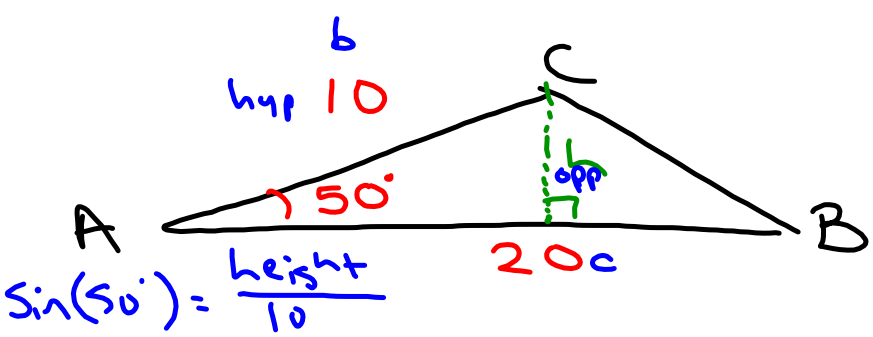
$$B = 180 - 23.8^\circ$$

$$B = \cos^{-1}\left(\frac{5^2 + 4^2 - 2^2}{(2 \cdot 5 \cdot 4)}\right)$$

$$\cos^{-1}\left(\frac{37}{40}\right)$$

$$B = 22.3$$

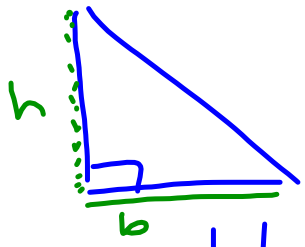
$$A = 180 - 22.3 - 48 = 109.7°$$



Find the area.

$\sin(50^\circ) = \frac{\text{height}}{10}$

$\text{height} = 10\sin(50)$



$\text{Area} = \frac{1}{2}bh$

$\frac{1}{2}\cdot 20 \cdot 10\sin(50)$

$\frac{1}{2}cb\sin A$

$\text{Area} = \frac{1}{2}cb\sin A$

$= \frac{1}{2}c\cdot a\cdot \sin B$

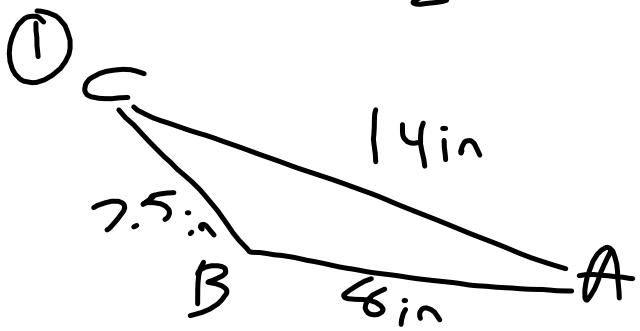
$= \frac{1}{2}b\cdot a\cdot \sin C$

SAS

Heron's formula. SSS

② $\text{Area} = \sqrt{(s(s-a)(s-b)(s-c))}$

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



① $\frac{(7.5+14+8)}{2}$

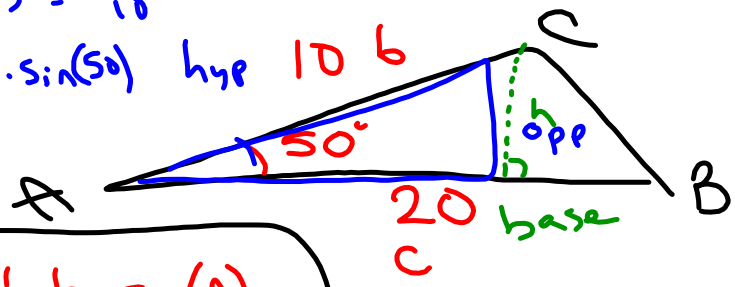
$= 14.75$

② $\sqrt{(14.75(14.75-7.5)(14.75-14)(14.75-8))}$

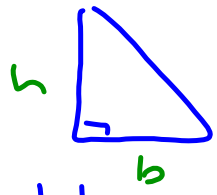
$= 23.3 \text{ in}^2$

$\sin(50) = \frac{\text{height}}{10}$

height $= 10 \cdot \sin(50)$ hyp 10 b



Find the area.



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

$\frac{1}{2}$ 20 $10\sin(50)$

Area $= \frac{1}{2}cb\sin(A)$

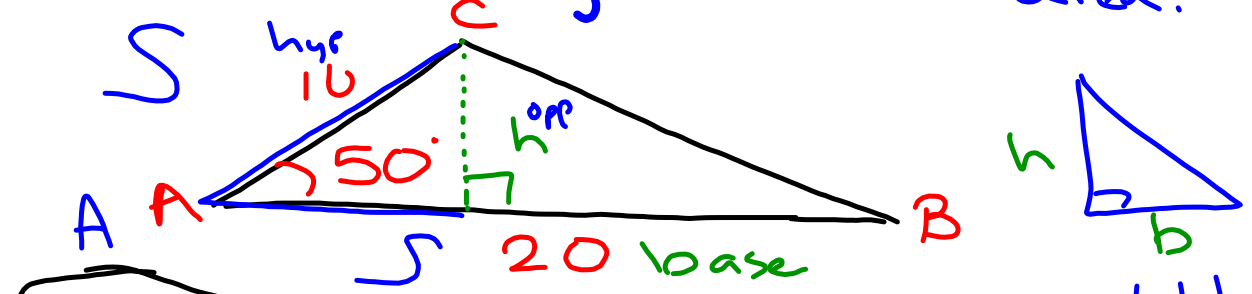
Area $= \frac{1}{2}bc\sin(A)$

$= \frac{1}{2}ac\sin(B)$

$= \frac{1}{2}ab\sin(C)$

SAS

$10 \cdot \sin(50) = \frac{\text{height}}{10}$ $\text{height} = 10 \cdot \sin(50)$ Find the area.



$\text{Area} = \frac{1}{2}bh$

$\frac{1}{2}\ 20 \cdot 10 \cdot \sin(50)$

$\text{area} = \frac{1}{2} c \cdot b \cdot \sin(A)$

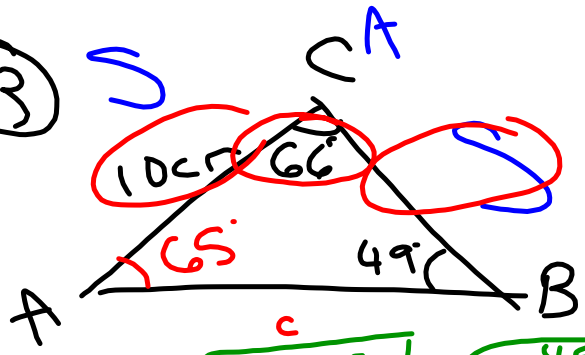
$\text{Area} = \frac{1}{2}bc \cdot \sin(A)$

$= \frac{1}{2}ac \cdot \sin(B)$

$= \frac{1}{2}ab \cdot \sin(C)$

SAS

(13)



S S S

A A S

↳ LoS

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

$$\frac{\sin 65}{a} = \frac{\sin 49}{10}$$

$$\frac{a\sin(49)}{\sin(49)} = \frac{10\cdot\sin(65)}{\sin(49)}$$

$$a = 12.01 \text{ cm}$$

$$\text{Area} = \frac{1}{2}ab\sin C$$

$$= \frac{1}{2}(12.01)(10)\sin(66)$$

$$= 54.85 \text{ cm}^2$$