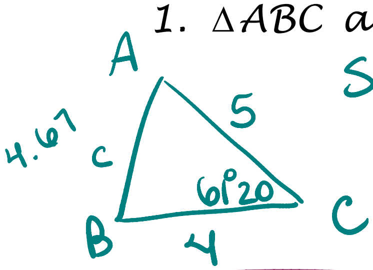
Solve that Triangle!!!!!

Use the procedures we learned in class to solve the following triangles and find the Area. Good Luck! ☺

1. ΔABC $a = 4$, $b = 5$ and $\angle C = 61°20'$



SAS - Cosines

$c^2 = 4^2 + 5^2 - 2(4)(5)\cos 61°20'$

$\boxed{c = 4.67}$

$\dfrac{\sin \angle A}{4} = \dfrac{\sin 61°20'}{4.67}$

$4.67 \sin\angle A = 4 \sin 61°20'$

$\sin\angle A = \dfrac{4\sin 61°20'}{4.67}$

$\angle A = \sin^{-1}(.7515)$

$\boxed{\angle A = 48.72°}$

$\angle B = 180 - 48.72 - 61°20'$

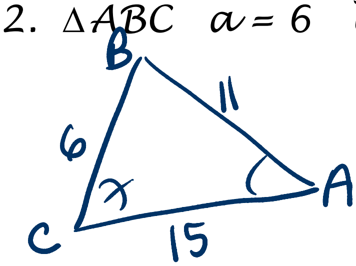
$\boxed{\angle B = 69.95°}$

Area:

$A = \frac{1}{2}(4)(5)\sin(61°20')$

8.77

2. ΔABC $a = 6$ $b = 15$ $c = 11$



SSS - Cosines

$6^2 = 15^2 + 11^2 - 2(15)(11)\cos\angle A$

$.9394 = \cos\angle A$

$\boxed{\angle A = 20.05°}$

$11^2 = 6^2 + 15^2 - 2(6)(15)\cos\angle C$

$.7778 = \cos\angle C$

$\boxed{\angle C = 38.94°}$ $\boxed{\angle B = 121.01°}$

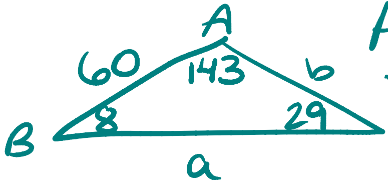
$s = \dfrac{15+11+6}{2} = 16$

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

$A = \sqrt{16(10)(1)(5)}$

$A = \sqrt{800} = \boxed{28.28}$

3. $\Delta ABC \quad c = 60 \quad \angle A = 143° \quad \angle B = 8°$



ASA
Sines

$\boxed{\angle C = 29°}$

$$\frac{\sin 8}{b} = \frac{\sin 29}{60}$$

$$b = \frac{60 \sin 8}{\sin 29}$$

$$\boxed{b = 17.22}$$

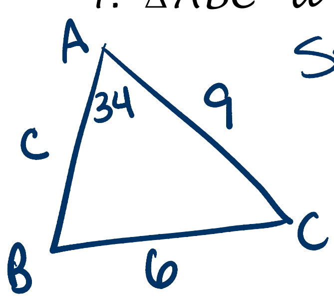
$$\frac{\sin 143}{a} = \frac{\sin 29}{60}$$

$$a = \frac{60 \sin 143}{\sin 29}$$

$$\boxed{a = 74.48}$$

$$\text{Area} = \frac{1}{2}(60)(74.48)\sin 8° = \boxed{310.97}$$

4. $\Delta ABC \quad a = 6 \quad b = 9 \quad \angle A = 34°$



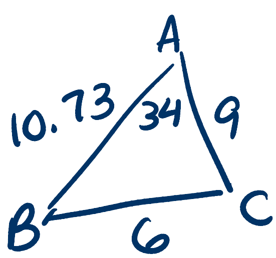
SSA - Cosines
ambiguous case

$$6^2 = c^2 + 9^2 - 2(9)(c)\cos 34°$$

$$0 = c^2 - 18\cos 34\, c + 45$$

$$c = 10.73, 4.19$$

2 Triangles



$\angle B$ is smaller than $\angle C$

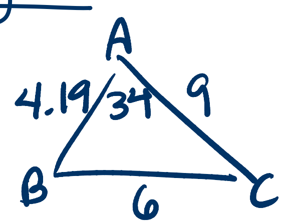
$$\frac{\sin 34}{6} = \frac{\sin B}{9}$$

$$\sin\angle B = \frac{9\sin 34}{6}$$

$$\boxed{\angle B = 57.01°}$$

$$\boxed{\angle C = 88.99°}$$

$$\text{Area} = \frac{1}{2}(9)(10.73)\sin 34 = \boxed{27.00}$$



$\angle C$ is smaller than $\angle B$

$$\frac{\sin 34}{6} = \frac{\sin\angle C}{4.19}$$

$$\sin\angle C = \frac{4.19 \sin 34}{6}$$

$$\boxed{\angle C = 22.99°}$$

$$\boxed{\angle B = 123.01°}$$

$$\text{Area} = \frac{1}{2}(4.19)(9)\sin 34 = \boxed{10.54}$$