Practice KEY

Precalculus   5.6 – Law of Sines/Cosines/Triangle Area Practice   Name _____

A) Determine what information is given about the triangle.
B) Determine whether to use the Law of Sines or the Law of Cosines to find the answer.
C) Find the length of the side or the measure of the angle indicated. Round to the nearest 10th.

1.   In $\triangle ABC$, b = 4, c = 5, and m$\angle A$ = 39°. Find a.
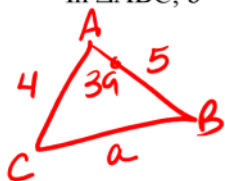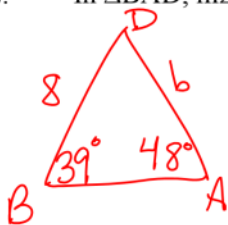
$$a^2 = 4^2 + 5^2 - 2(4)(5)\cos 39°$$

$$\boxed{a = 3.1}$$

SAS - Law of Cosines

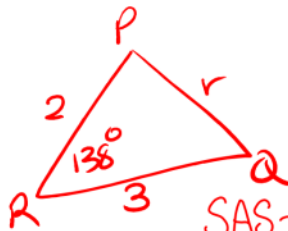2.   In $\triangle BAD$, m$\angle A$ = 48°, m$\angle B$ = 39°, and a = 8. Find b.

AAS - Law of Sines

$$\frac{\sin 48°}{8} = \frac{\sin 39°}{b}$$

$$\boxed{b \approx 6.8}$$

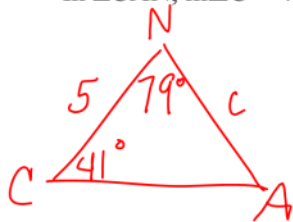3.   In $\triangle PQR$, p = 3, q = 2, and m$\angle R$ = 138°. Find r.

$$r^2 = 2^2 + 3^2 - 2(2)(3)\cos 138°$$

$$\boxed{r = 4.7}$$

SAS - Law of Cosines

4.   In $\triangle CAN$, m$\angle C$ = 41°, a = 5, and m$\angle N$ = 79°. Find c.
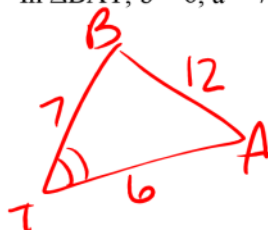
ASA - Law of Sines

$$m\angle A = 60°$$

$$\frac{\sin 60°}{5} = \frac{\sin 41°}{c}$$

$$\boxed{c \approx 3.8}$$

5.   In $\triangle BAT$, b = 6, a = 7, and t = 12. Find m$\angle T$.

$$12^2 = 7^2 + 6^2 - 2(7)(6)\cos \angle T$$

$$59 = -84\cos \angle T$$

$$\angle T = \cos^{-1}\left(-\frac{59}{84}\right) = \boxed{134.6°}$$

SSS - Law of Cosines

6. In $\triangle GON$, if g = 8, o = 3, and n = 12. Find m$\angle$N.

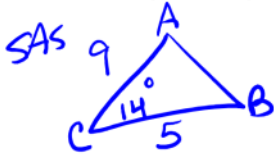$$12^2 = 3^2 + 8^2 - 2(3)(8)\cos \angle N$$

$$71 = -48\cos \angle N$$

$$\angle N = \cos^{-1}\left(\frac{-71}{48}\right) = \text{No solution!}$$

Not a $\triangle$ - why ?!?
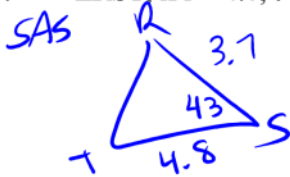
SSS-Law of Cosines

Find the area of the given triangle. Round to the nearest hundredth.
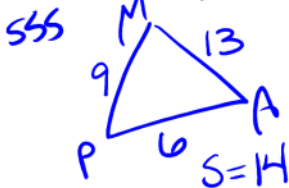
7. $\triangle ABC$, if a = 5, b = 9, and $\angle C = 14°$.

SAS

$$A = \frac{1}{2}(9)(5)\sin 14° = \boxed{5.44}$$

8. $\triangle RST$, if r = 4.8, t = 3.7, and $\angle S = 43°$.

SAS

$$A = \frac{1}{2}(4.8)(3.7)\sin 43° = \boxed{6.06}$$

9. $\triangle MAP$, if m = 6, a = 9, and p = 13.

SSS

S = 14

$$A = \sqrt{14(14-6)(14-9)(14-13)}$$

$$\boxed{A = 23.66}$$