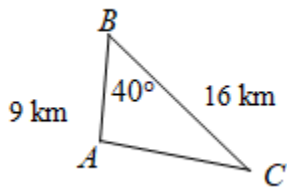**Secondary Math III**
Law of Cosines / Area
Assignment 7.4

Name_____
Period_____

Use the *Law of Cosines* to solve triangle ABC.
- **Determine which situation is given: SAS or SSS.**
- **Round all angle measures to the nearest degree and all side lengths to the nearest tenth.**
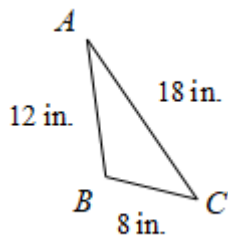
.

1.

Given Situation:_____

Angle A = _____

Angle C = _____

Side b = _____

2.

Given Situation:_____

Angle A = _____

Angle B = _____

Angle C = _____

Use the *Law of Sines or Cosines* to solve triangle ABC.
- **Draw and label the triangles first.**
- **Determine which situation is given: ASA, AAS, SSA, SAS, or SSS.**
- **If two triangles exist, solve both triangles and write both values on provided lines.**
- **Round all angle measures to the nearest degree and all side lengths to the nearest tenth.**

3. $A = 40°$, $a = 15$, $b = 18$

Given Situation:_____

Angle B = _____

Angle C = _____

Side c = _____

4. $A = 52°$, $B = 15°$, $c = 25$

Given Situation:_____

Angle C = _____

Side a = _____

Side b = _____

5. $a = 45$, $b = 30$, $c = 18$

Given Situation:_____

Angle A = _____

Angle B = _____

Angle C = _____

6. Mary, Robert and Isaac have cottages on a lake. Isaac's cottage is between Mary's and Robert's. The distance from Mary's cottage to Isaac's is 283 feet and the distance from Isaac's cottage to Robert's is 197 feet. If the angle formed by the three cottages is 123°, what is the direct distance from Mary's cottage to Robert's? Round to the nearest tenth of a foot.
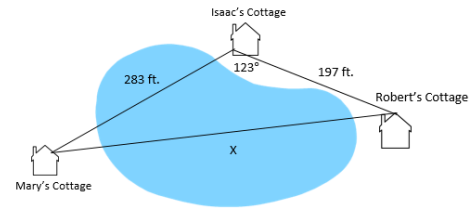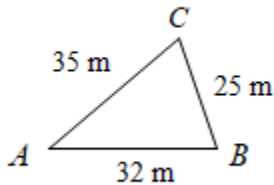

Find the area of the following triangles with the given sides and/or angles. Round all answers to the nearest whole number.

7. $a = 16$ in, $c = 24$ in, $B = 42°$

8. $a = 53$ ft, $A = 13°$, $B = 72°$

9.

ACT:

10. The sides of an acute triangle measure 14 cm, 18 cm, and 20 cm, respectively. Which of the following equations, when solved for θ, gives the measure of the smallest angle of the triangle?

(Note: For any triangle with sides of length a, b, and c that are opposite angles A, B, and C, respectively, $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$ and $c^2 = a^2 + b^2 - 2ab \cos C$.)

F. $\frac{\sin \theta}{14} = \frac{1}{18}$
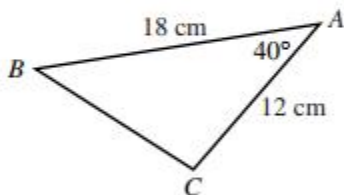
G. $\frac{\sin \theta}{14} = \frac{1}{20}$

H. $\frac{\sin \theta}{20} = \frac{1}{14}$

J. $14^2 = 18^2 + 20^2 - 2(18)(20)\cos \theta$

K. $20^2 = 14^2 + 18^2 - 2(14)(18)\cos \theta$

11. Triangle $\triangle ABC$ is shown in the figure below. The measure of $\angle A$ is 40°, $AB = 18$ cm, and $AC = 12$ cm. Which of the following is the length, in centimeters, of $\overline{BC}$?

(Note: For a triangle with sides of length a, b, and c opposite angles $\angle A$, $\angle B$, and $\angle C$, respectively, the law of sines states $\frac{\sin \angle A}{a} = \frac{\sin \angle B}{b} = \frac{\sin \angle C}{c}$ and the law of cosines states $c^2 = a^2 + b^2 - 2ab \cos \angle C$.)

A. $12 \sin 40°$

B. $18 \sin 40°$

C. $\sqrt{18^2 - 12^2}$

D. $\sqrt{12^2 + 18^2}$

E. $\sqrt{12^2 + 18^2 - 2(12)(18)\cos 40°}$