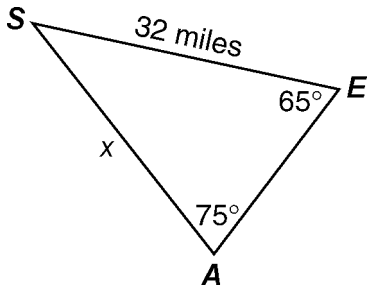
Name: _____

CC Geometry Honors

Law of Sines Homework

1) The accompanying diagram shows the approximate linear distances traveled by a sailboat during a race. The sailboat started at point *S*, traveled to points *E* and *A*, respectively, and ended at point *S*.



Based on the measures shown in the diagram, which equation can be used to find *x*, the distance from point *A* to point *S*?

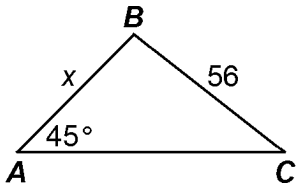
A) $\frac{x}{\sin 65^\circ} = \frac{\sin 75^\circ}{32}$

B) $\frac{x}{65} = \frac{32}{75}$

C) $\frac{65}{x} = \frac{32}{75}$

D) $\frac{\sin 65^\circ}{x} = \frac{\sin 75^\circ}{32}$

2) What additional information is needed in the accompanying diagram to solve for the value of *x* using the Law of Sines?



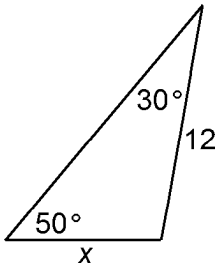
A) measures of both $\angle C$ and side *AC*

B) measure of side *AC*

C) measure of $\angle C$

D) measures of both $\angle B$ and $\angle C$

3) What is the value of the missing side *x* in the non-right triangle below?



A) 31.33

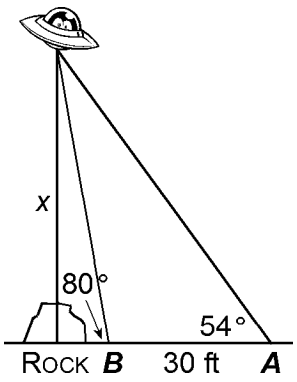
B) 4.60

C) 18.39

D) 7.83

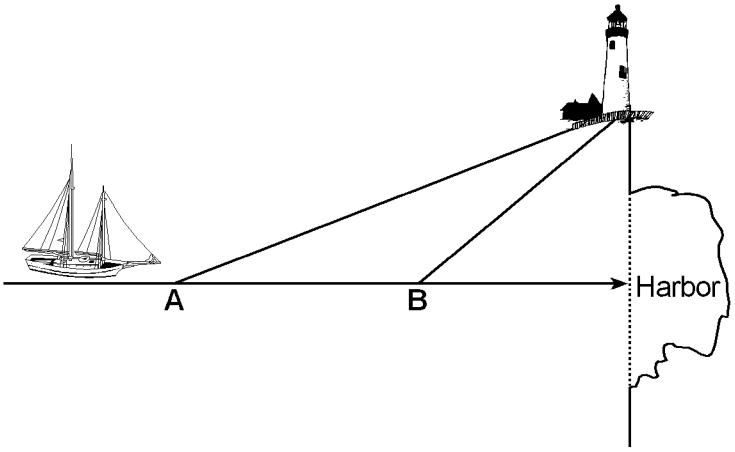
4) In ΔABC, $AB = 56$, $AC = 54$, and $m\angle C = 37^\circ$. Find $m\angle A$ and $\angle B$ to the nearest degree. [*Justify each step of your solution.*]

5) Two observers, *A* and *B*, standing 30 feet apart, watch a flying saucer hover directly above a large rock.



Use the information shown in the diagram to find the distance (*x*) the flying saucer hovers above the ground to the nearest tenth of a foot. [*If performing multiple calculations, do not round until the last step.*] [*Show all work to justify your answer.*]

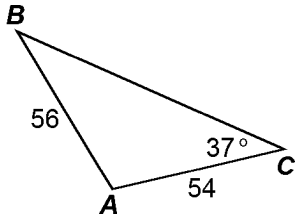
6) A ship is heading for a harbor. As the ship passes through point *A*, the navigator sights a lighthouse at a 10° angle straight ahead. The ship continues on a straight course toward the harbor for 5 miles to reach point *B*. From point *B*, the angle to the lighthouse is found to be 30°.



How far is point *B* from the entrance to the harbor? [*Round the answer to the nearest tenth of a mile.*] [*Show all work*.]

1) D 2) C 3) D

4) $\angle B = 35°$, $\angle A = 108°$

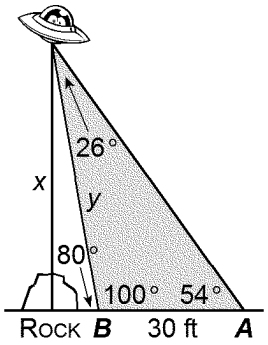


Find m$\angle B$: $\frac{\sin 37}{56} = \frac{\sin B}{54}$, Cross multiply and solve for $\angle B$ by using $\sin^{-1}\frac{54 \sin 37}{56} = \sin^{-1}\frac{54(0.60181)}{56} = \sin^{-1}\frac{32.49801}{56} =$ $\sin^{-1}(0.58032) = 35.47316 \approx 35$;

Find m$\angle A$: Subtract the two know angle measures from the sum of interior angles of a triangle., $\angle A = 180 - 37 - 35 = 108$

5) 54.5 feet

WORK SHOWN:



For the shaded triangle: At Observer B is a linear pair of angles, so $180 - 80 = 100°$ for the inside angle.;

m$\angle UFO = 180 - (54 + 100) = 26°$; $\frac{\sin 26}{30} = \frac{\sin 54}{y}$, $\sin 26 \cdot y = 30 \cdot \sin 54$, $0.438 \cdot y = 30 \cdot 0.809$, $y = \frac{24.271}{0.438} = 55.365$; For the unshaded right triangle: $\sin 80 = \frac{x}{55.365}$, $x = (0.985)(55.365) = 54.524 \approx 54.5$

6) 2.2 miles

WORK SHOWN: Let L = top of light house, let H = Harbor entrance; $\angle ALB = 180 - 10 - (180 - 30) = 20$; $\frac{5}{\sin 20°} = \frac{BL}{\sin 10°}$,

$BL = \frac{5 \sin 10°}{\sin 20°} = 2.5386$; $\cos 30° = \frac{BH}{2.5386}$, $BH = (\cos 30°)(2.5386) = 2.1985 \approx 2.2$