

**I. Find the asked side or angle for each triangle. Round to tenth place. Show work!**

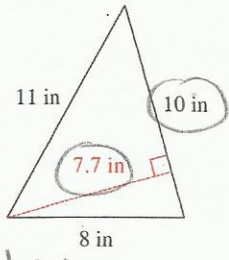
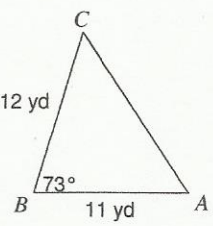
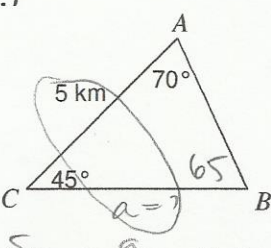
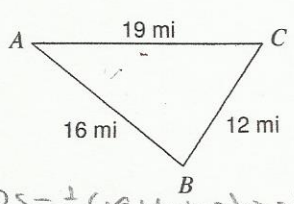
<p>1.) Find: side b</p> $\frac{26}{\sin 52} = \frac{b}{\sin 58}$ $b = \frac{26 \sin 58}{\sin 52}$ <p>Answer: <u>b=28</u></p>	<p>2.) Find: largest angle</p> $32^2 = 30^2 + 22^2 - 2(30)(22)\cos B$ $1024 = 1384 - 1320\cos B$ $B = \cos^{-1}\left(\frac{-360}{-1320}\right)$ <p>Answer: <u>B=74.2°</u></p>	<p>3.) Find: angle C</p> $\frac{50}{\sin 95} = \frac{43}{\sin C}$ $C = \sin^{-1}\left(\frac{43 \sin 95}{50}\right)$ <p>Answer: <u>C=59°</u></p>	<p>4.) Find: side a</p> $a^2 = 25^2 + 33^2 - 2(25)(33)\cos 101$ $a = \sqrt{2028.834842}$ <p>Answer: <u>a=45</u></p>
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**II. State and find what is asked for each triangle. Round to tenth place. Use appropriate letters! Show all of your work for each part no matter how simple it is!**

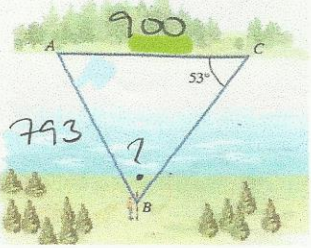
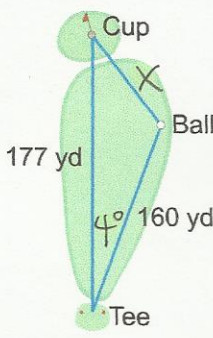
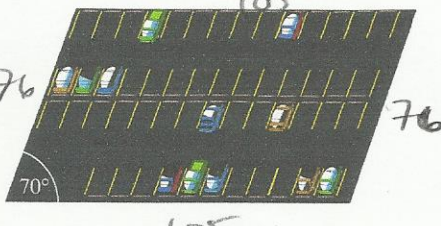
Given Triangle	Type of Triangle Method	Required Work	Answers
<p>5.)</p>	<p>AAS <math>\Delta</math></p> <p>Law of Sines</p>	<p>① <math>C = 180 - 92 - 59</math> <u>C=29°</u></p> <p>② <math>\frac{35}{\sin 92} = \frac{b}{\sin 59}</math> <u>b=30</u></p> <p>③ <math>\frac{35}{\sin 92} = \frac{c}{\sin 29}</math> <u>C=17</u></p>	<p>C=29°</p> <p>b=30</p> <p>C=17</p>
<p>6.)</p>	<p>SSS <math>\Delta</math></p> <p>Law of Cosines</p>	<p>① <math>13^2 = 9^2 + 12^2 - 2(9)(12)\cos A</math> <u>A=75°</u></p> <p>② <math>\frac{13}{\sin 75} = \frac{12}{\sin B}</math> <u>B=63.1°</u></p> <p>③ <math>C = 180 - 75 - 63.1</math> <u>C=41.9°</u></p>	<p>A=75°</p> <p>B=63.1°</p> <p>C=41.9°</p>
<p>7.)</p>	<p>SSA <math>\Delta</math></p> <p>Law of Sines</p>	<p>① <math>\frac{33}{\sin 75} = \frac{29}{\sin A}</math> <u>A=58.1°</u></p> <p>② <math>C = 180 - 75 - 58.1</math> <u>C=46.9°</u></p> <p>③ <math>\frac{33}{\sin 75} = \frac{c}{\sin 46.9}</math> <u>C=24.9</u></p>	<p>A=58.1°</p> <p>C=46.9°</p> <p>C=24.9</p>
<p>8.) *</p>	<p>SAS <math>\Delta</math></p> <p>Law of Cosines</p>	<p>① <math>b^2 = 21^2 + 45^2 - 2(21)(45)\cos 34</math> <u>b=30</u></p> <p>② <math>\frac{30}{\sin 34} = \frac{21}{\sin C}</math> <u>C=23°</u></p> <p>③ <math>A = 180 - 34 - 23</math> <u>A=123°</u></p>	<p>A=123°</p> <p>C=23°</p> <p>b=30</p>



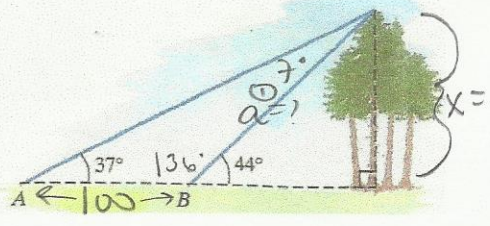
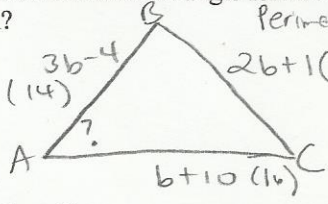
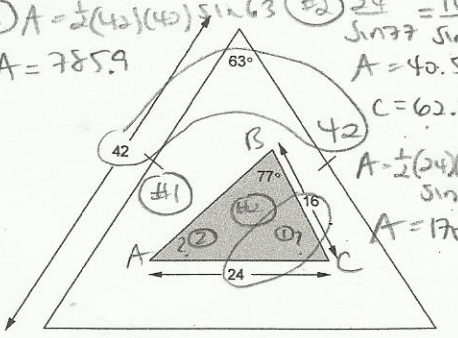
### III. Using appropriate formula, find the area of each triangle. Round to tenth place. Show work!

<p>9.)</p>  $A = \frac{1}{2}bh$ $A = \frac{1}{2}(8)(7.7)$ <p>Area of <math>\Delta = 31.6 \text{ in}^2</math></p>	<p>10.)</p>  $A = \frac{1}{2}ab \sin C$ $A = \frac{1}{2}(12)(11) \sin 73$ <p>Area of <math>\Delta = 63.1 \text{ yd}^2</math></p>	<p>11.)</p>  $\frac{5}{\sin 65} = \frac{a}{\sin 70} \rightarrow a = 5.2$ $A = \frac{1}{2}ab \sin C$ $A = \frac{1}{2}(5)(5.2) \sin 45$ <p>Area of <math>\Delta = 9.2 \text{ km}^2</math></p>	<p>12.)</p>  $s = \frac{1}{2}(19+16+12) = 23.5$ $A = \sqrt{s(s-a)(s-b)(s-c)}$ $A = \sqrt{23.5(23.5-19)(23.5-16)(23.5-12)}$ <p>Area of <math>\Delta = 95.5 \text{ mi}^2</math></p>
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### IV. Simple Word Problems – Complete each problem that requires only one step for the answer.

<p>13.) A surveyor is standing opposite of two points (A and C) on the bank of a river. The distance between the two points is 900 feet. The width of the river opposite of point C is 793 feet. What is the angle formed at the surveyor?</p>  $\frac{793}{\sin 53} = \frac{900}{\sin B}$ $B = 65^\circ$	<p>14.) A golfer hits a golf ball at a <math>4^\circ</math> from the ball's straight path to the cup. How far does the ball lie from the cup?</p>  $X^2 = 177^2 + 160^2 - 2(177)(160) \cos 4$ $X = 20.7 \text{ yd}$	<p>15.) An office building has a parallelogram shaped parking lot with side lengths of 76 meters and 105 meters. What is the area of the parking lot?</p>  $A = 2 \left( \frac{1}{2} \cdot 76 \cdot 105 \sin 70 \right)$ $A = 7498.7 \text{ m}^2$
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### V. Complex Word Problems – Complete each problem that requires multiple steps for the answer.

<p>16.) The distance between two points on the ground is 100 ft. What is the height of the tree?</p>  $\frac{100}{\sin 7} = \frac{a}{\sin 37}$ $a = 493.8$ $\frac{493.8}{\sin 90} = \frac{X}{\sin 44}$ $X = 343 \text{ ft}$	<p>17.) Adam is designing a triangular pen in his backyard with lengths: <math>(2b+1)</math> ft, <math>(b+10)</math> ft, and <math>(3b-4)</math> ft. Adam has 43 ft of fencing for the pen. What is the smallest angle formed by the pen?</p>  $3b-4 + b+10 + 2b+1 = 43$ $6b+7 = 43 \rightarrow b=6$ $13^2 = 16^2 + 14^2 - 2(16)(14) \cos A$ $A = 50.8^\circ$	<p>18.) A dart is thrown at the board below. What is the probability that the dart will land in the shaded region?</p>  $A = \frac{1}{2}(42)(42) \sin 63$ $A = 785.9$ $A = \frac{1}{2}(24)(24) \sin 77$ $A = 170.3$ $\frac{\text{Area } \Delta \#2}{\text{Area } \Delta \#1} \rightarrow \frac{170.3}{785.9} = 21.7\%$
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