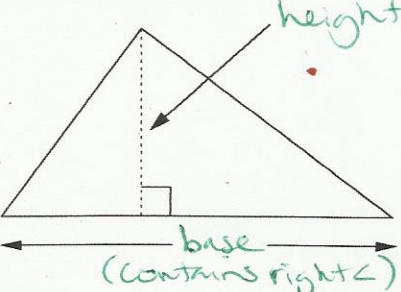
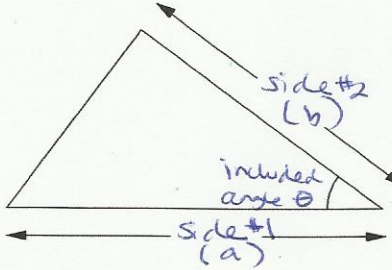
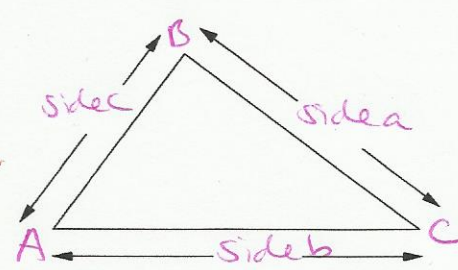
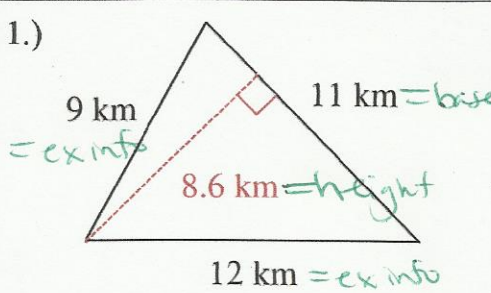
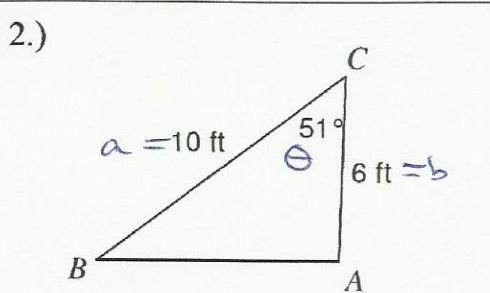
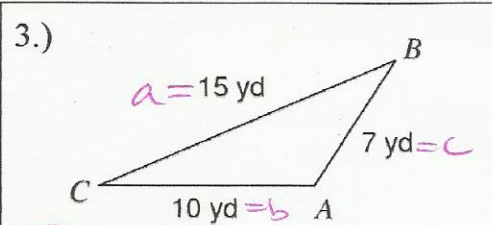
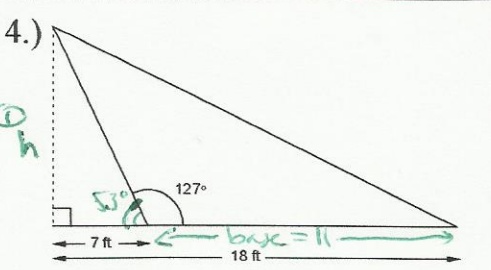
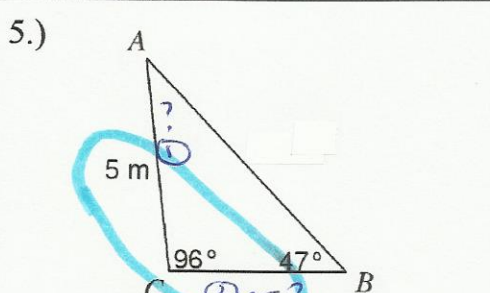
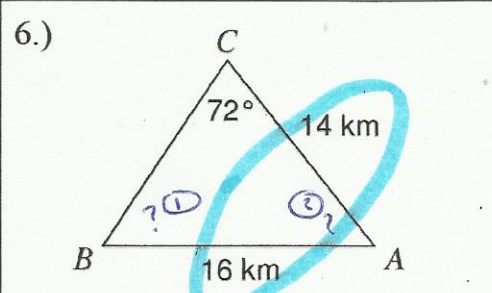


Triangle Trigonometry – Area of a Triangle (Using Three Formulas)

| Area of a Triangle Formula # 1 | Area of a Triangle Formula # 2 | Area of a Triangle Formula # 3 |
|--|--|---|
| <p>Area = $\frac{1}{2} \cdot b \cdot h$</p> <p>where given Δ has a <u>right \angle</u></p>  | <p>Area = $\frac{1}{2} a \cdot b \cdot \sin \theta$</p> <p>where given Δ is <u>SAS Δ</u></p>  | <p>Area = $\sqrt{s(s-a)(s-b)(s-c)}$</p> <p>where <u>$s = \frac{1}{2}(a+b+c)$</u> (s = semiperimeter) and given Δ is <u>SSS Δ</u></p>  |

Examples: Using the appropriate formula, find the area of each triangle. Round to tenth place.

| | | |
|---|---|---|
| <p>1.)</p>  <p>9 km 12 km = ex info 11 km = base 8.6 km = height</p> <p>$A = \frac{1}{2} b \cdot h$ $A = \frac{1}{2} (12)(8.6)$ $A = 47.3 \text{ km}^2$</p> | <p>2.)</p>  <p>$a = 10 \text{ ft}$ $b = 6 \text{ ft}$ $\theta = 51^\circ$</p> <p>$A = \frac{1}{2} ab \sin \theta$ $A = \frac{1}{2} (10)(6) \sin 51$ $A = 23.3 \text{ ft}^2$</p> | <p>3.)</p>  <p>$a = 15 \text{ yd}$ $b = 10 \text{ yd}$ $c = 7 \text{ yd}$</p> <p>① $s = \frac{1}{2}(15+10+7)$ $s = 16$</p> <p>② $A = \sqrt{s(s-a)(s-b)(s-c)}$ $A = 29.4 \text{ yd}^2$</p> |
| <p>4.)</p>  <p>① $\tan 53 = \frac{h}{7}$ $h = 7 \tan 53$ $h = 9.3$</p> <p>② $A = \frac{1}{2} b h$ $A = \frac{1}{2} (18)(9.3)$ $A = 51.2 \text{ ft}^2$</p> | <p>5.)</p>  <p>① $A = 180 - 96 - 47$ $A = 37^\circ$</p> <p>② $\frac{s}{\sin 47} = \frac{a}{\sin 37}$ $\frac{a \sin 47}{\sin 47} = \frac{5 \sin 37}{\sin 47}$ $a = 4.1$</p> <p>③ $A = \frac{1}{2} ab \sin \theta$ $A = \frac{1}{2} (5)(4.1) \sin 96$ $A = 10.2 \text{ m}^2$</p> | <p>6.)</p>  <p>① $\frac{16}{\sin 72} = \frac{14}{\sin B}$ $\frac{16 \sin B}{16} = \frac{14 \sin 72}{16}$ $B = \sin^{-1}(\frac{14 \sin 72}{16})$ $B = 56.3^\circ$</p> <p>② $A = 180 - 72 - 56.3$ $A = 51.7$</p> <p>③ $A = \frac{1}{2} ab \sin \theta$ $A = \frac{1}{2} (16)(14) \sin 51.7$ $A = 87.9 \text{ km}^2$</p> |