

Pre-Calculus Chapter 6 Test Individual Test Review
All answers must be accurate to 2 decimal places.

1. Solve $\triangle ABC$ and find $\angle F$ in $\triangle DEF$:

$C = 180^\circ - 20^\circ - 54^\circ = 106^\circ$
 $\frac{\sin 20^\circ}{25} = \frac{\sin 106^\circ}{c}$
 $c \sin 20^\circ = 25 \sin 106^\circ$
 $c = 70.26$
 $\frac{\sin 20^\circ}{25} = \frac{\sin 54^\circ}{b}$
 $b \sin 20^\circ = 25 \sin 54^\circ \rightarrow b = 59.14$

$\cos F = \frac{25^2 + 35^2 - 15^2}{2(25)(35)}$
 $\cos F = 0.92857$
 $F = 21.79^\circ$

2. Find $m\angle I$:

$\frac{\sin 5.28^\circ}{9} = \frac{\sin 75^\circ}{98}$
 $I = 21.72^\circ$
 $\frac{\sin 75^\circ}{98} = \frac{\sin H}{100}$
 $100 \sin 75^\circ = 98 \sin H$
 $98.564 = \sin H \rightarrow H = 80.28^\circ$
 99.72°

3. Find the area of each triangle below. You must use Heron's formula,

$A = \sqrt{s(s-a)(s-b)(s-c)}$, on one, and the formula for area of an oblique triangle, $A = \frac{1}{2}bc \sin A$, on the other. You must show your work.

$A = \sqrt{9(9-5)(9-7)(9-6)}$
 $A = 14.70$
 $s = \frac{5+7+6}{2} = 9$

$A = \frac{1}{2}(10)(21) \sin 58^\circ$
 $A = 89.05$

4. You and Bob are standing on point A. You walk 100 meters to point B. Bob walks 125 meters to point C. There is a 50° angle between your path and Bob's path.

a) What is the distance between points B and C?

b) What is the measure of $\angle BAC$?

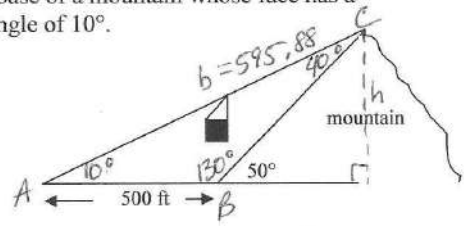
$a^2 = 125^2 + 100^2 - 2(125)(100) \cos 50^\circ$
 $a^2 = 9555.309758$
 $a = 97.75m$

$\frac{\sin B}{125} = \frac{\sin 50^\circ}{97.75}$
 $\sin B = 0.977596$
 $B = 78.41^\circ$

5. An aerial tram starts at a point 500 feet from the base of a mountain whose face has a 50° angle of elevation. The tram ascends at an angle of 10° .

a) What is the length of the cable?

b) How high is the mountain?



$$a) \frac{\sin 40^\circ}{500} = \frac{\sin 130^\circ}{b}$$

$$\boxed{b = 595.88 \text{ ft}}$$

$$b) \sin 10^\circ = \frac{h}{595.88}$$

$$h = 595.88 \sin 10^\circ$$

$$\boxed{h = 103.47 \text{ ft}}$$