Law of Sines and Cosines   Franz Helfenstein   Name _____
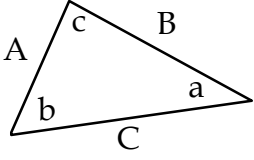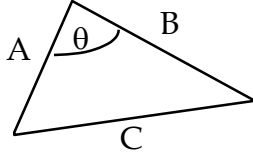
Write in each missing dimension and angle. If a % grade is indicated write it in. ATTACH YOUR WORK!
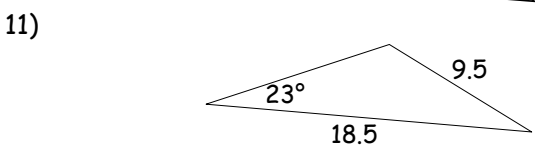
Law of Sines

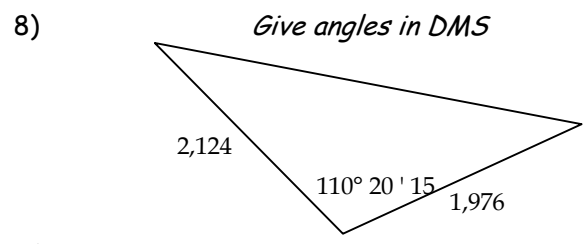$$\frac{\sin a}{A} = \frac{\sin b}{B} = \frac{\sin c}{C}$$

Law of Cosines

$$A^2 + B^2 - 2AB\cos\theta = C^2$$

$$\cos\theta = \frac{A^2 + B^2 - C^2}{2AB}$$

1) 40   20°   30°

2) 20°   50 ft   30 ft

3) 40°   80   20°

4) 35°   50 ft   30 ft

5) 120°   9,000 ft   25°

6) 564 ft   443 ft   1,006 ft

7) 130°   40   40

8) *Give angles in DMS*   2,124   110° 20 ' 15   1,976

9) 88°   624 ft   AREA (in acres)   985 ft

10) 50   90% grade   60

11) 9.5   23°   18.5
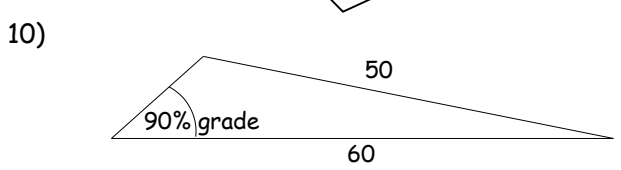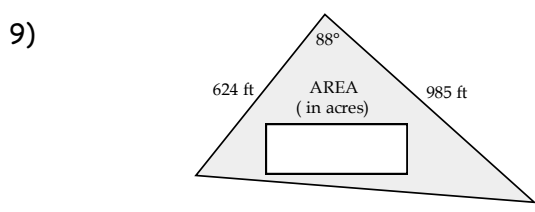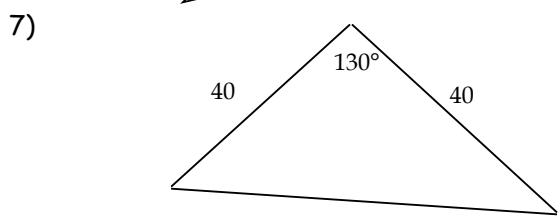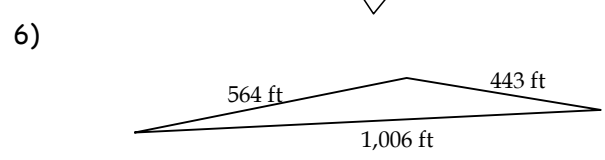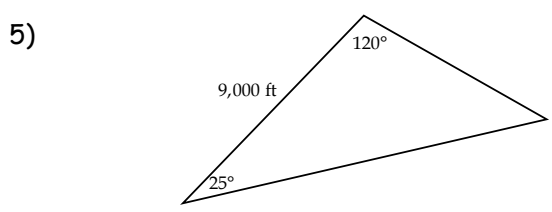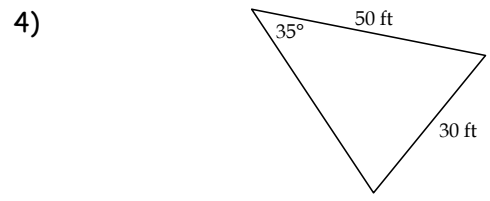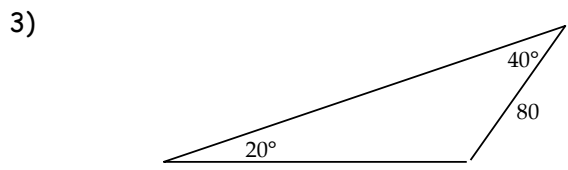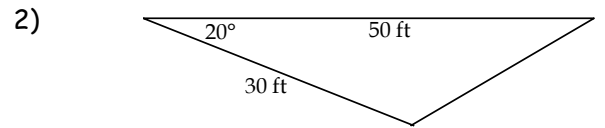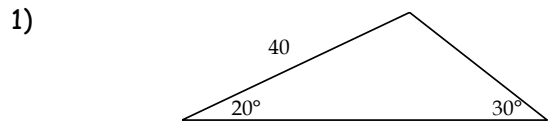
12) Use the Law of Cosines and the Quadratic formula to solve for B as a function of A, C, θ.

13) Bobby leaves camp chasing a butterfly to point A heading N 28° W. He runs for 548 ft before the butterfly changes direction. Now he runs 1,120 ft at N 69° E to point B. At this point the butterfly disappears and Bobby realizes he is somewhat lost. But he is a boy scout and is well prepared with his trusty compass. What direction must he head back to camp and how far is it?
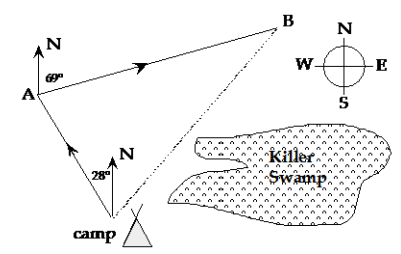
Random Triangles   Name

Write in each dimension and each angle. Where a % grade is indicated write it in. ATTACH YOUR WORK!

89° 782
37°

391
36°
252

103°
52°
237

48°
298
684

35
64° 50

52°
23° 1,258

116°
63
35°

75 80
94°

44
46°
68

46°
784 722

1,225 478
1,105

56

89 106
94

1,355 738
42°

72°
18