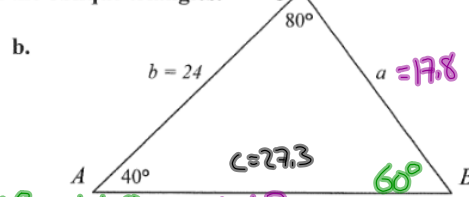
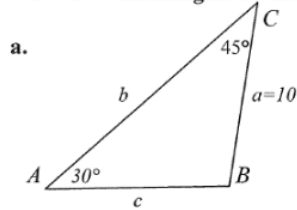


Name \_\_\_\_\_

Date \_\_\_\_\_

## Practice 9.2: The Law of Sines

1. Find the remaining sides and angles of the oblique triangles.



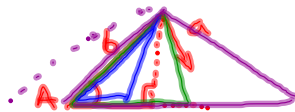
$$\frac{\sin 60^\circ}{24} = \frac{\sin 40^\circ}{a} \quad \frac{\sin 60^\circ}{24} = \frac{\sin 80^\circ}{c}$$

$$a \sin 60^\circ = 24 \sin 40^\circ \quad \frac{c \sin 60^\circ}{\sin 60^\circ} = \frac{24 \sin 80^\circ}{\sin 60^\circ}$$

$$a = \frac{24 \sin 40^\circ}{\sin 60^\circ} = 17.8 \quad c = \frac{24 \sin 80^\circ}{\sin 60^\circ}$$

c.  $A = 50^\circ, C = 20^\circ, b = 200$

d.  $A = 10^\circ, B = 50^\circ, a = 12$



2. Use the given information to find the number of triangle possible.

a.  $A = 60^\circ, b = 20, a = 19$   $h = 20 \sin 60^\circ = 20 \cdot \frac{\sqrt{3}}{2} = 10\sqrt{3}$   $h < a < b$  2Δ's

b.  $A = 60^\circ, b = 20, a = 21$   $a > b$  1Δ

c.  $A = 30^\circ, b = 10, a = 5$   $h = 17.32$

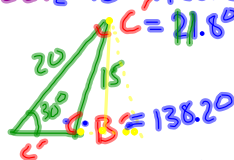
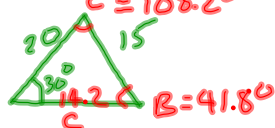
d.  $A = 30^\circ, b = 10, a = 4$

e.  $A = 53^\circ, b = 25, a = 28$

f.  $A = 53^\circ, b = 25, a = 22$

3. Find the remaining sides and angles of the oblique triangles (2).

a.  $A = 30^\circ, b = 20, a = 15$   $h = b \sin A = 20 \sin 30^\circ = 20 \cdot \frac{1}{2} = 10$   $h < a < b$  2Δ's



$$\frac{\sin 30^\circ}{15} = \frac{\sin B}{20}$$

$$\frac{20 \sin 30^\circ}{15} = \frac{\sin B}{20}$$

$$\sin^{-1}\left(\frac{20 \sin 30^\circ}{15}\right) = B = 41.8^\circ$$

$$\frac{\sin 30^\circ}{15} = \frac{\sin 108.2^\circ}{c}$$

$$\frac{c \sin 30^\circ}{\sin 30^\circ} = \frac{15 \sin 108.2^\circ}{\sin 30^\circ}$$

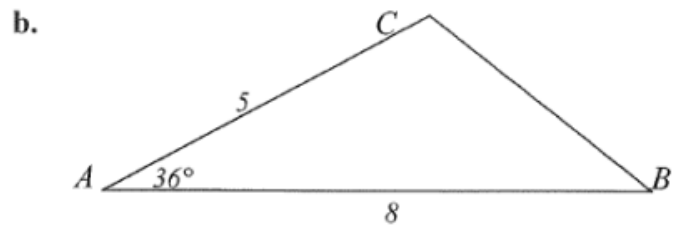
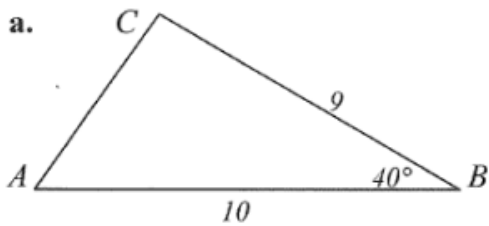
$$c = 14.2 \quad 28.5$$

$$B' = 180^\circ - B = 138.2^\circ$$

$$\frac{\sin 30^\circ}{15} = \frac{\sin 11.8^\circ}{c'}$$

$$\frac{c' \sin 30^\circ}{\sin 30^\circ} = \frac{15 \sin 11.8^\circ}{\sin 30^\circ}$$

## 4. Find the Area of the triangles.

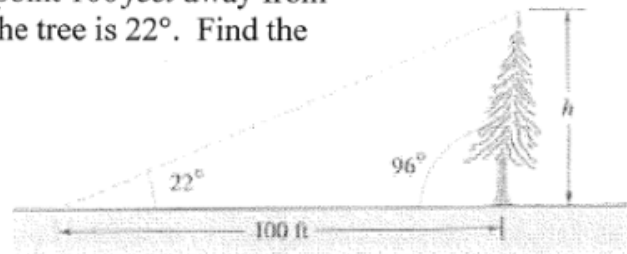


c.  $C = 125^\circ, b = 10, a = 5$

d.  $A = 45^\circ, B = 10^\circ, a = 4$

5. The following information about of a triangular parcel of land is given at a zoning board meeting. "One side is 450 *meters* long, and another is 120 *meters*. The angle opposite the shorter side is  $30^\circ$ ." Could this be true?

6. A tree grows leaning  $6^\circ$  from vertical. At a point 100 *feet* away from the tree, the angle of elevation to the top of the tree is  $22^\circ$ . Find the height  $h$  of the tree.



7. A bridge is being built across a small lake from  $B$  to  $C$ . The bearing between them is  $S 41^\circ W$ . From point  $A$ , 100 yards from  $B$ , the bearings to  $B$  and  $C$  are  $S 74^\circ E$  and  $S 28^\circ E$ . Find the distance from  $B$  to  $C$ .

