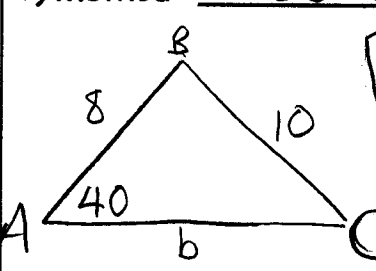


**Directions:** Solve each triangle. Please show all work and round all answers to the nearest hundredths. Be sure to check for a second set of solutions (if one exists) and write these answers on the lines provided.

1) Method: SSA



$$\frac{10}{\sin(40)} = \frac{8}{\sin(c)}$$

$$10 \sin(109.05) = 8 \sin(c)$$

$$\frac{10 \sin(109.05)}{8} = \sin(c)$$

$$\sin^{-1}\left(\frac{10 \sin(109.05)}{8}\right) = c$$

$$\frac{10 \sin(109.05)}{8} = \sin(c)$$

$$\frac{10 \sin(109.05)}{8} = \sin(c)$$

$$\frac{10 \sin(109.05)}{8} = \sin(c)$$

$$A = 40^\circ$$

$$B = 109.05$$

$$C = 30.95$$

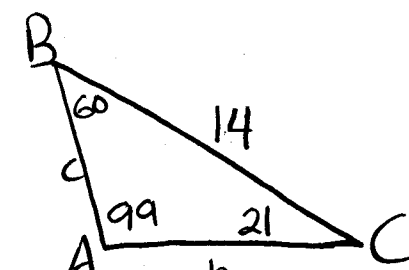
$$a = 10$$

$$b = 14.71$$

$$c = 8$$

(Longer, 1 solution)

2) Method: AAS



$$\frac{14}{\sin(99)} = \frac{c}{\sin(21)}$$

$$14 \sin(21) = c \sin(99)$$

$$\frac{14 \sin(21)}{\sin(99)} = c$$

$$\frac{14}{\sin(99)} = \frac{b}{\sin(60)}$$

$$14 \sin(60) = b \sin(99)$$

$$\frac{14 \sin(60)}{\sin(99)} = b$$

$$A = 99$$

$$B = 60^\circ$$

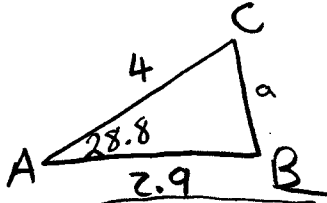
$$C = 21^\circ$$

$$a = 14$$

$$b = 12.28$$

$$c = 5.08$$

3) Method: SAS



$$a^2 = 4^2 + 2.9^2 - 2(4)(2.9)\cos(28.8)$$

$$a^2 = 4.08$$

$$a = 2.02$$

$$\frac{2.02}{\sin(28.8)} = \frac{2.9}{\sin(C)}$$

$$C = \sin^{-1}\left(\frac{2.9 \sin(28.8)}{2.02}\right)$$

\* Find smaller angle

$$A = 28.8^\circ$$

$$B = 107.44^\circ$$

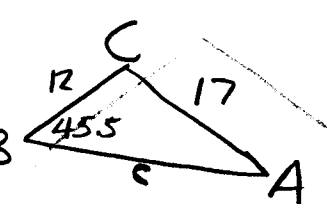
$$C = 43.76^\circ$$

$$a = 2.02$$

$$b = 4$$

$$c = 2.9$$

4) Method: SSA



$$\frac{17}{\sin(45.5)} = \frac{12}{\sin(A)}$$

$$17 \sin(A) = 12 \sin(45.5)$$

$$A = \sin^{-1}\left(\frac{12 \sin(45.5)}{17}\right)$$

$$\frac{17}{\sin(45.5)} = \frac{c}{\sin(104.27)}$$

$$c = \frac{17 \sin(104.27)}{\sin(45.5)}$$

$$A = 30.23^\circ$$

$$B = 45.5^\circ$$

$$C = 104.27$$

$$a = 12$$

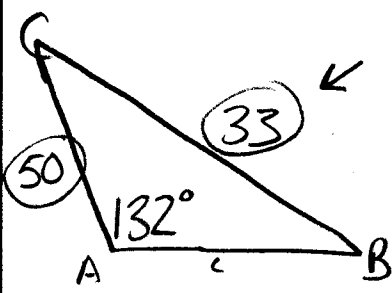
$$b = 17$$

$$c = 23.10$$

Longer - 1 solution

**Directions:** Solve each triangle. Please show all work and round all answers to the nearest hundredths. Be sure to check for a second set of solutions (if one exists) and write these answers on the lines provided.

5) Method: SSA



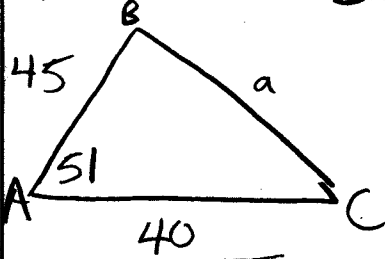
Longest side is not across from largest angle!  
Can't be a triangle!

or  $\frac{33}{\sin(132)} = \frac{50}{\sin(B)}$   
Calc Error

A = 132°  
B = \_\_\_\_\_  
C = \_\_\_\_\_  
a = 33  
b = 50  
c = \_\_\_\_\_

**No Triangle**

6) Method: SAS



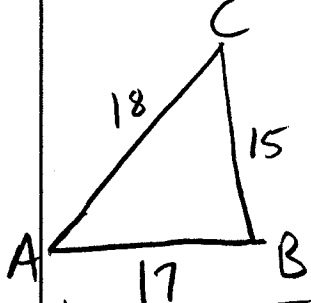
$a^2 = 45^2 + 40^2 - 2(40)(45)\cos(51)$  (1)  
 $a = 36.87$

$\frac{40}{\sin(B)} = \frac{36.87}{\sin(51)}$  (2)  
 $B = \sin^{-1}\left(\frac{40 \sin(51)}{36.87}\right)$

A = 51°  
B = 57.47  
C = 71.53  
a = 36.87  
b = 40  
c = 45

Not Across (SAS) from angle

7) Method: SSS

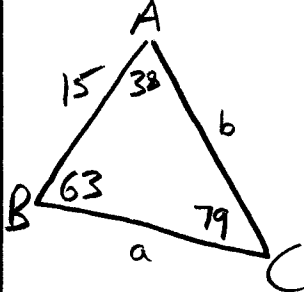


$\frac{15}{\sin(50.66)} = \frac{17}{\sin(C)}$  (2)  
 $C = \sin^{-1}\left(\frac{17 \sin(50.66)}{15}\right)$

Shortest (1)  $15^2 = 17^2 + 18^2 - 2(17)(18)\cos(A)$   
 $225 = 613 - 612 \cos(A)$   
 $-388 = -612 \cos(A)$   
 $A = \cos^{-1}\left(\frac{388}{612}\right)$

A = 50.66°  
B = \_\_\_\_\_  
C = \_\_\_\_\_  
a = 15  
b = 18  
c = 17

8) Method: ASA



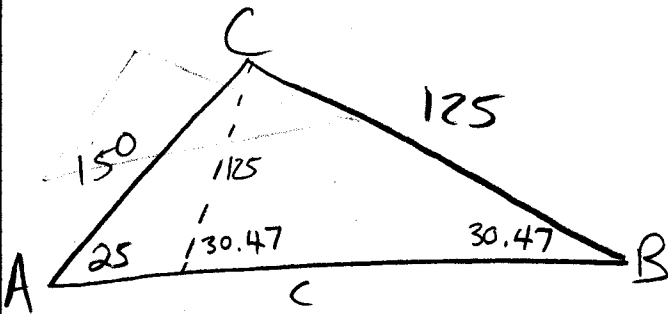
(1)  $\frac{15}{\sin(79)} = \frac{a}{\sin(38)}$   
 $a = \frac{15 \sin(38)}{\sin(79)}$

(2)  $\frac{15}{\sin(79)} = \frac{b}{\sin(63)}$   
 $b = \frac{15 \sin(63)}{\sin(79)}$

A = 38°  
B = 63°  
C = 79°  
a = 9.41  
b = 13.62  
c = 15

**Directions:** Solve each triangle. Please show all work and round all answers to the nearest hundredths. Be sure to check for a second set of solutions (if one exists) and write these answers on the lines provided.

9) Method: SSA



$$\frac{125}{\sin(25)} = \frac{150}{\sin B}$$

$$B = \frac{150 \sin(25)}{125}$$

$$\frac{125}{\sin(25)} = \frac{c}{\sin(124.53)}$$

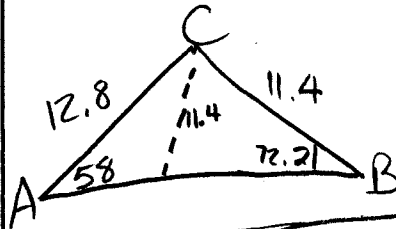
$$c = \frac{125 \sin(124.53)}{\sin(25)}$$

A = 25°  
B = 30.47  
c = 124.53

a = 125  
b = 150  
c = 243.67

0 or 2 (smaller)

10) Method: SSA



$$\frac{11.4}{\sin(58)} = \frac{12.8}{\sin(B)}$$

$$B = \sin^{-1}\left(\frac{12.8 \sin(58)}{11.4}\right)$$

$$\frac{11.4}{\sin(58)} = \frac{c}{\sin(49.79)}$$

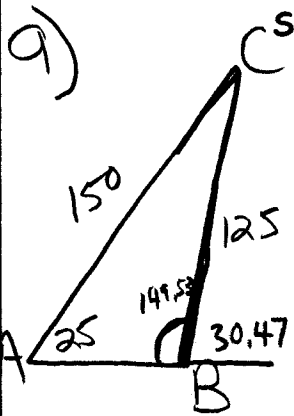
$$c = \frac{11.4 \sin(49.79)}{\sin(58)}$$

A = 58°  
B = 72.21°  
c = 49.79°

a = 11.4  
b = 12.8  
c = 10.27

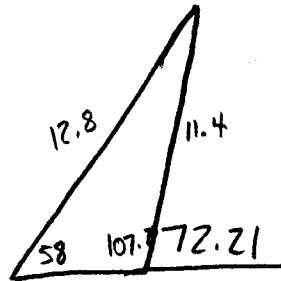
0 or 2

Space for work in case of second set of solutions for #1-10



$$\frac{c}{\sin(5.47)} = \frac{125}{\sin(25)}$$

A = 25° a = 125  
B = 149.53° b = 150  
C = 5.47° c = 28.19



$$\frac{12.8}{\sin(107.79)} = \frac{c}{\sin(14.21)}$$

$$c = \frac{12.8 \sin(14.21)}{\sin(107.79)}$$

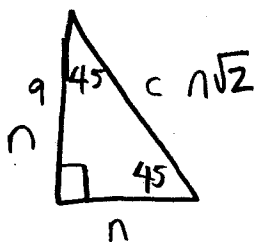
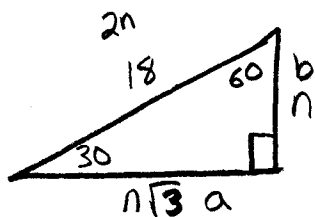
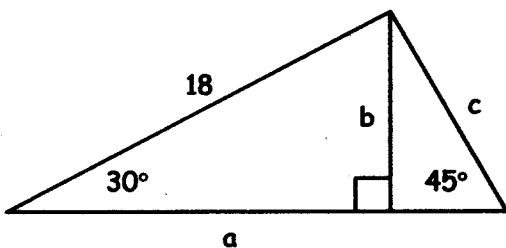
A = 58° a = 11.4  
B = 107.79° b = 12.8  
C = 14.21 c = 3.30

1st  
△

2nd  
△

Directions: Find all indicated variables. (x and y refer to angle measures; a, b, c, and d refer to side lengths). If possible, leave your answer as a simplified square root. If you must have a decimal answer, round all answers to the nearest hundredth.

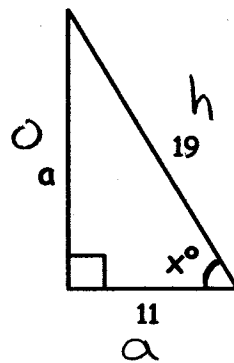
11) No decimal answers!



$2n = 18$   
 $n = 9$

$a = \frac{9\sqrt{3}}{1}$   
 $b = \frac{9}{1}$   
 $c = \frac{9\sqrt{2}}{1}$

12) Please leave the side (a) as a radical.

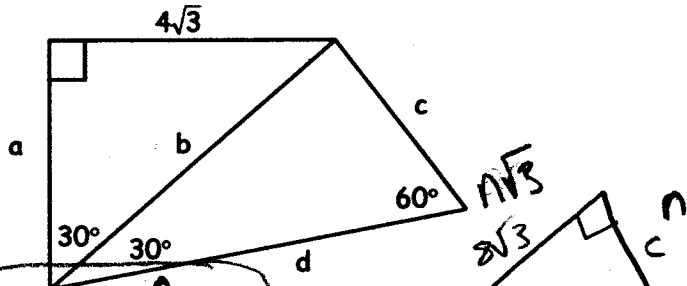


$a^2 + 11^2 = 19^2$   
 $a^2 = 2140$   
 $a = \sqrt{2140}$   
 $a = \sqrt{16 \cdot 134}$   
 $a = 4\sqrt{134}$

$\cos(x) = \frac{11}{19}$   
 $x = \cos^{-1}\left(\frac{11}{19}\right)$   
 $x = 54.62$

$a = \frac{4\sqrt{15}}{1}$   
 $x = \frac{54.62}{1}$

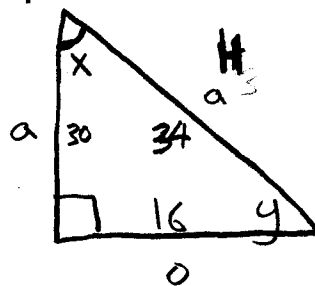
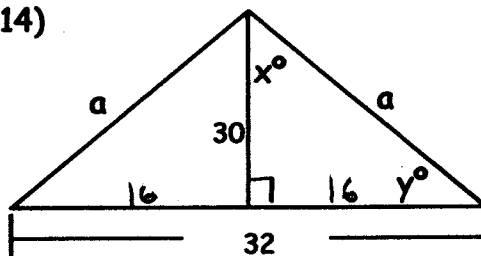
13) No decimal answers!



$n\sqrt{3} = 4\sqrt{3}$   
 $n = 4$   
 $a = 4\sqrt{3} \cdot \frac{1}{2} = 2\sqrt{3}$   
 $b = 2 \cdot 4\sqrt{3} = 8\sqrt{3}$   
 $a = 4\sqrt{3} \cdot \frac{\sqrt{3}}{2} = 6$   
 $b = 8\sqrt{3}$   
 $a = 12$   
 $b = 8\sqrt{3}$

$a = \frac{12}{1}$   
 $b = \frac{8\sqrt{3}}{1}$   
 $c = \frac{8}{1}$   
 $d = \frac{16}{1}$

14)



$16^2 + 30^2 = a^2$   
 $1156 = a^2$   
 $\sqrt{1156} = a$   
 $34 = a$

$\sin(x) = \frac{16}{34}$   
 $x = \sin^{-1}\left(\frac{16}{34}\right)$   
 $x = 28.07$

$a = \frac{34}{1}$   
 $x = \frac{28.07^\circ}{1}$   
 $y = \frac{61.93^\circ}{1}$