# Station 1   Using Formulas

Name __Kev__   Per

Which law would you use for solving a triangle, given the figure and information? DO NOT SOLVE.

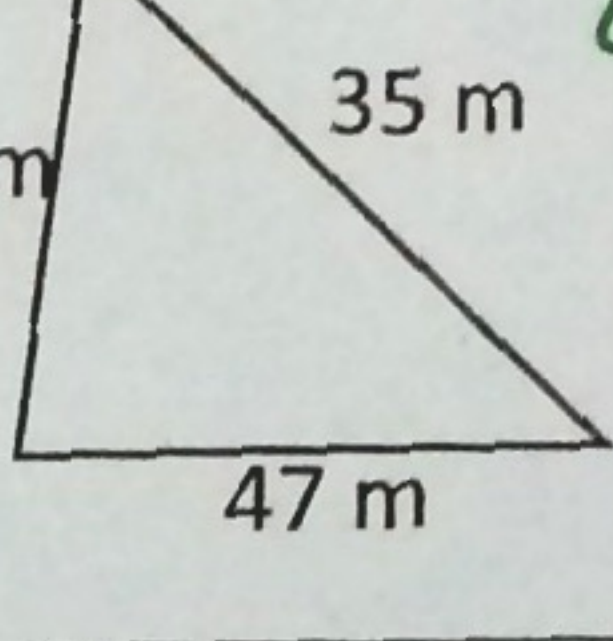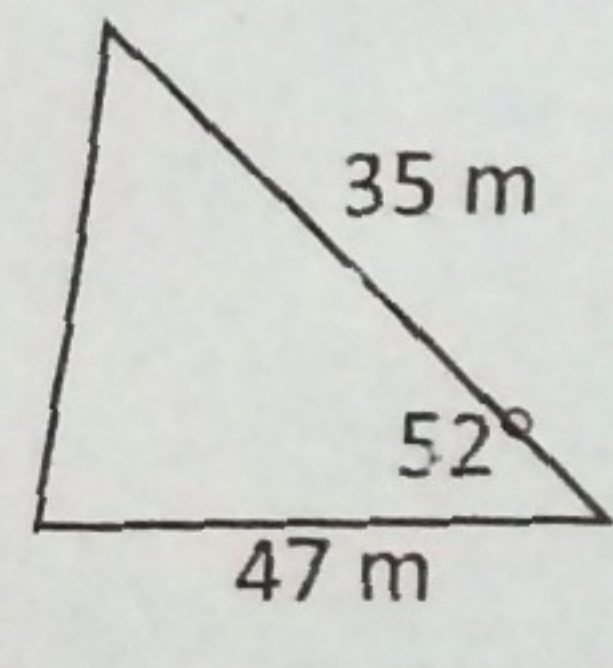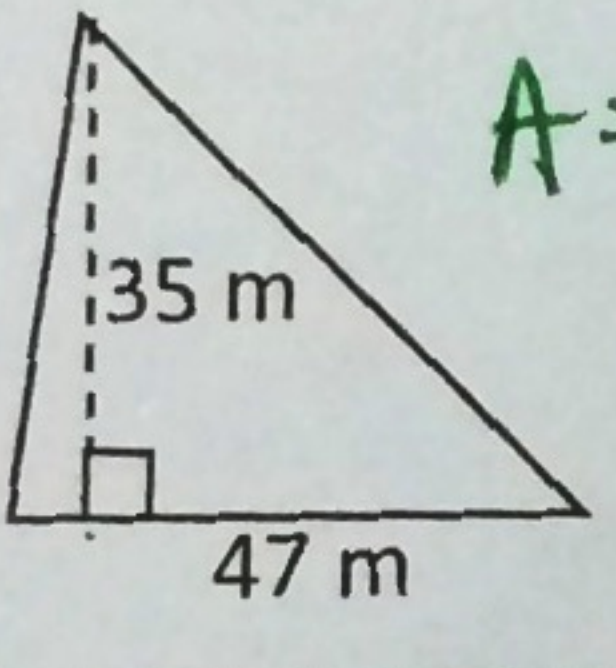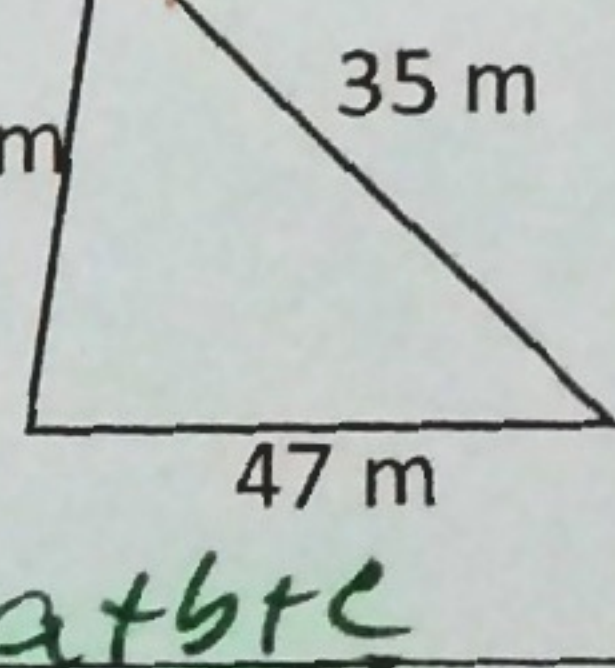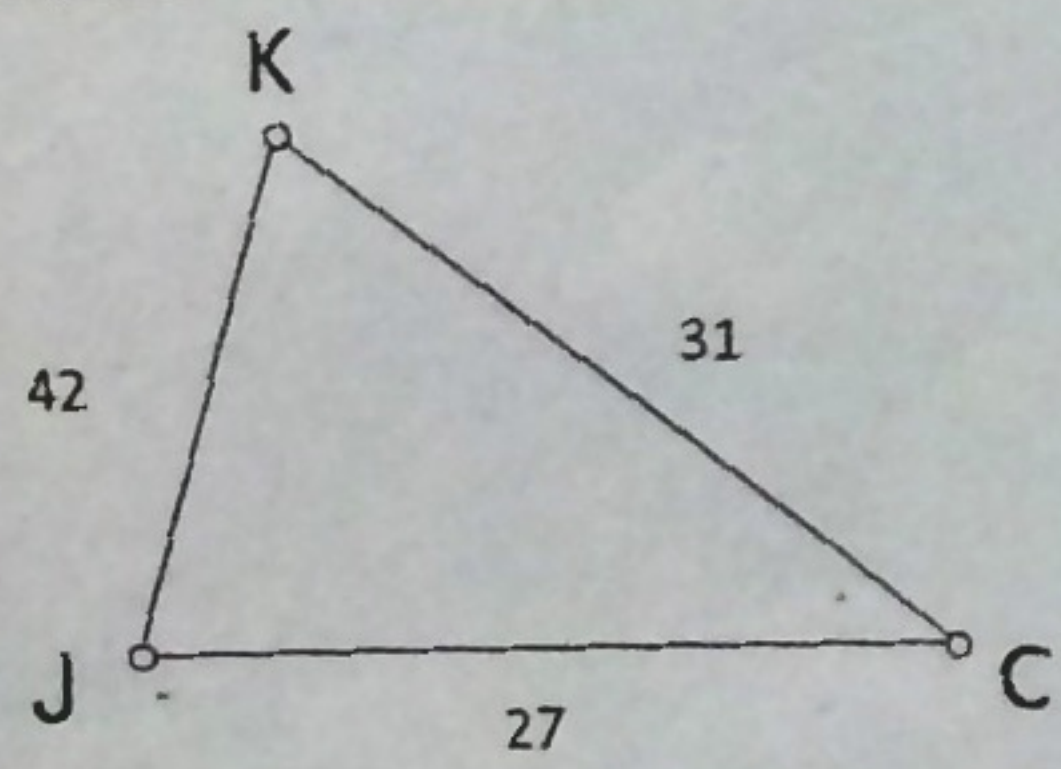| 1. SAS | 2. ASA | 3. AAS  Law Sine | 4. SSS  Law Cosine |
|---|---|---|---|
| Law ~~Sine~~ Cosine  35 m  52° 47 m | Law ~~Cosine~~ Sine  35°  52° 47 m | 81  35 m  47°  52° | 52 m  35 m  47 m |

Which formula for the area of a triangle should you use, given: DO NOT SOLVE

| 5. SAS | 6. Base and Altitude | 7. SSS  Herons |
|---|---|---|
| oblique  $A = \frac{1}{2}ab\sin C$  35 m  52° 47 m | $A = \frac{1}{2}b \cdot h$  35 m  47 m | 52 m  35 m  47 m  $s = \dfrac{a+b+c}{2}$  $K = \sqrt{s(s-a)(s-b)(s-c)}$ |

Using the diagram, Determine whether the following statements are **True** or **False**?
**IF FALSE; CORRECT IT TO MAKE IT TRUE!**

| K  31  42  J  27  C | 8. False  $31^2 = 42^2 + 27^2 - 2(42)(27)\cos K$   $\cos J$ | 9. $\dfrac{\sin C}{42} = \dfrac{\sin J}{\cancel{27}\ 31}$  False  OR $\dfrac{\sin C}{42} = \dfrac{\sin K}{27}$ |
|---|---|---|
|  | False  10. $A_\Delta = \frac{1}{2}(42)(27)\cancel{\cos}J$   $\sin$ | 11. $m\angle J = \cos^{-1}\left(\dfrac{27^2 + 42^2 - 31^2}{2(42)\cancel{(31)}\ 27}\right)$  False |
| 12. False  $A = \sqrt{50(50\cancel{+}42)(50\cancel{+}31)(50\cancel{+}27)}$  $-\ -\ -$ | False  13. $m\angle K = \cos^{-1}\left(\dfrac{27^2 + 42^2 - 31^2}{2(42)\cancel{(27)}\ 31}\right)$ | 14. $A_\Delta = \frac{1}{2}(42)(27)\sin J$  True |

Station 2 Test 3.2 Right Triangle Trig      Name_____Key_____ Per____

Find the indicated value for each. SHOW ALL WORK. Calculator Ready!!!, then solve to the nearest tenth.
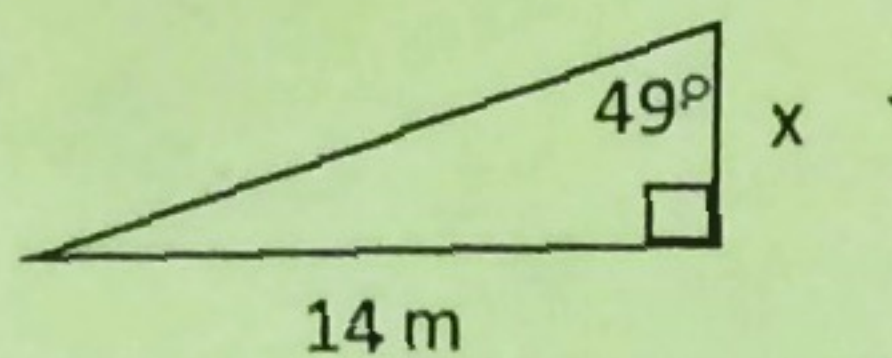
**1. Find x.**

25 cm, $x°$, 21 cm
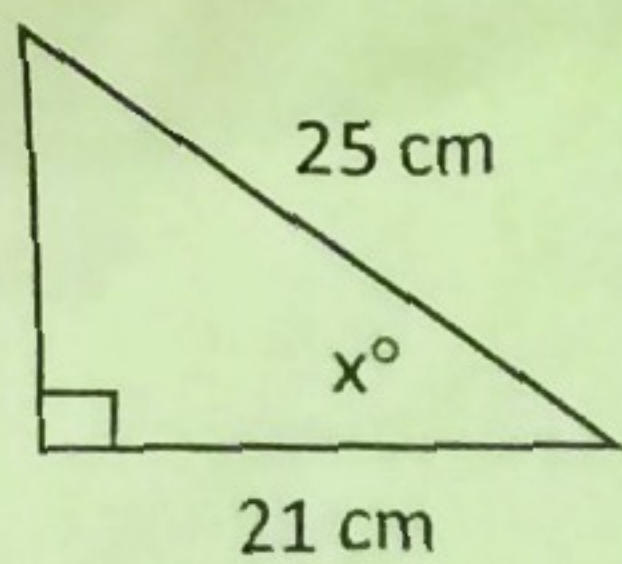
$\cos x = \dfrac{21}{25}$

$x \approx 32.9°$

$\boxed{32.9°}$

**2. Find x.**

$49°$, x, 14 m

$\tan 49 = \dfrac{14}{x}$

$x = \dfrac{14}{\tan 49}$

$x \approx 12.2$

$\boxed{12.2}$

**3. Find SQ.**

R, 13, 2, 250 ft, $34°$, $146°$, $21°$, P, S, (x), Q
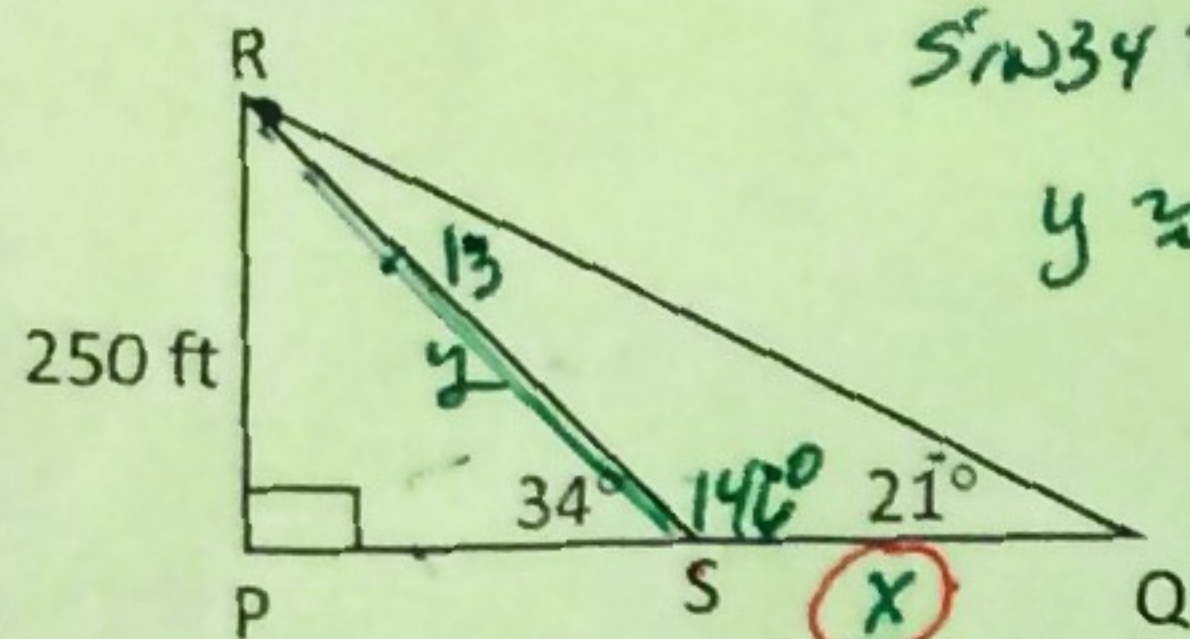
$\sin 34 = \dfrac{250}{y}$    $y = \dfrac{250}{\sin 34}$

$y \approx 447.1$

$\dfrac{\sin 21}{447.1} = \dfrac{\sin 13}{x}$

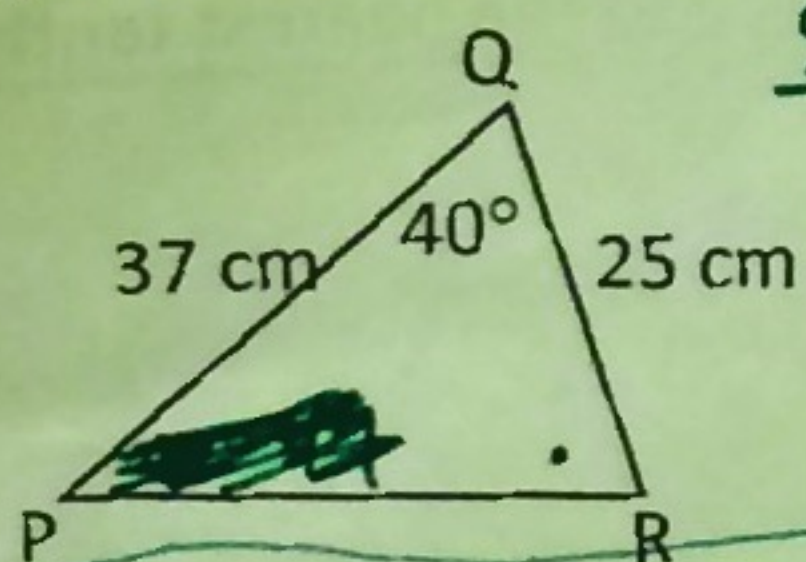$x \approx 280.4$

$\boxed{280.4}$

**4. Find AC.**

A, $45°$, x, $98°$, $37°$, B, 20, C
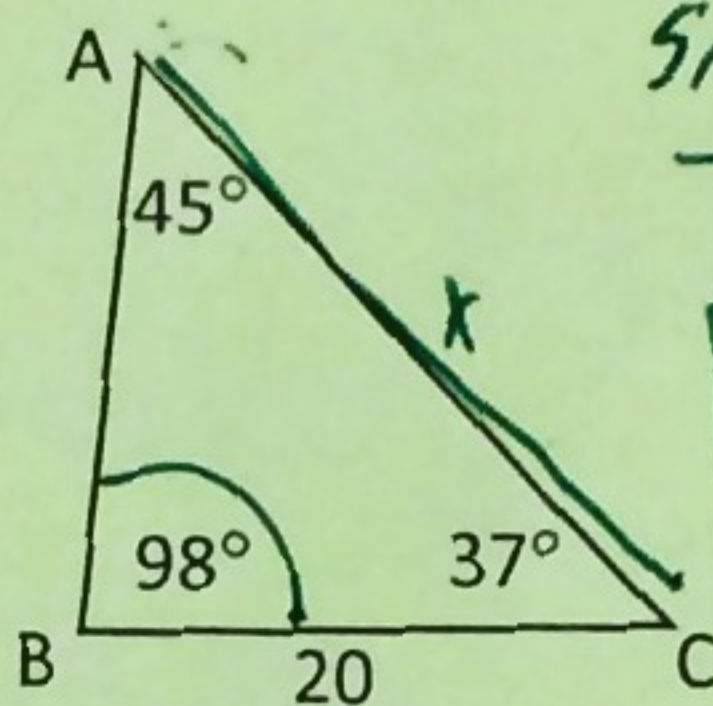
$\dfrac{\sin 98}{x} = \dfrac{\sin 45}{20}$

$\boxed{x = \dfrac{20 \sin 98}{\sin 45}}$

$x \approx 28$

$\boxed{28}$

**5. Find PR.**

Q, $40°$, 37 cm, 25 cm, P, R

$\dfrac{\sin 47}{25} = \dfrac{\sin R}{37}$

$\sin R =$

$r^2 = 37^2 + 25^2 - 2(37)(25)\cos 40$

$\approx 24.6$

$\boxed{24}$

**6. Find AC.**

A, 25, $35.8°$, B, 17.1, C
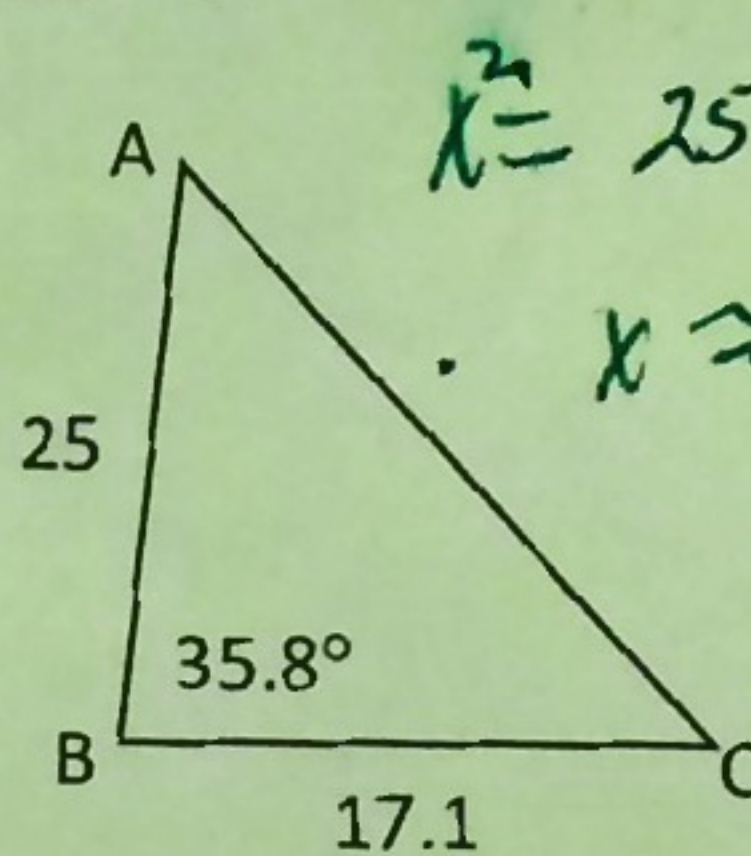
$x^2 = 25^2 + 17.1^2 - 2(25)(17.1)\cos 35.8$

$x \approx 15.0$

$\boxed{15.0}$

**7. Find $\angle R$.**

Q, 32 cm, 11 cm, x, R, $85°$, P
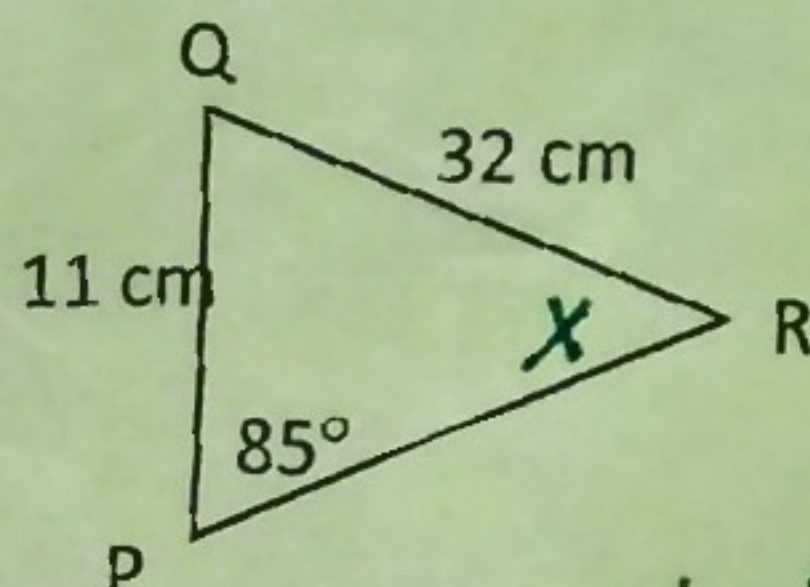
$\dfrac{\sin x}{11} = \dfrac{\sin 85}{32}$    $\sin x = \dfrac{11 \sin 85}{32}$

$x = 20°$

$\boxed{20°}$

**8. Find $\angle C$.**

A, 63, 41, x, B, 54, C
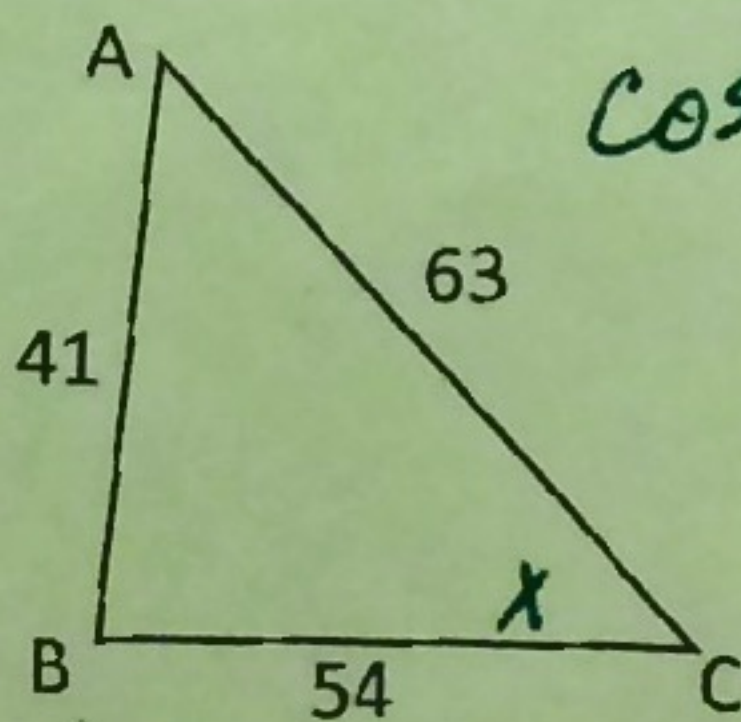
$\cos C = \dfrac{63^2 + 54^2 - 41^2}{2(63)(54)}$
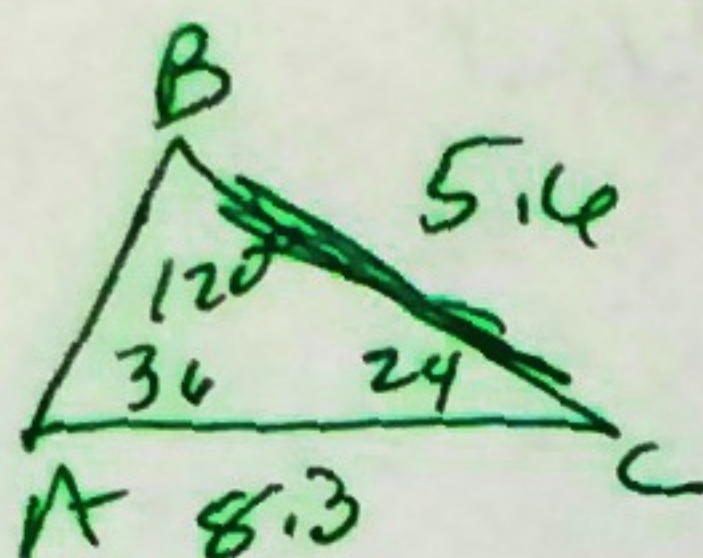
$C = 40.1°$

$\boxed{40.1°}$

# Station 3 Answer sheet          Name.

**Scavenger Hunt**
1. Start with any question with an ORANGE boarder.
2. Show all work in the 2nd column, write answer in 1st column.
3. After you find the answer, walk around until you find the answer at the top of another paper.
4. Answer that question and repeat.
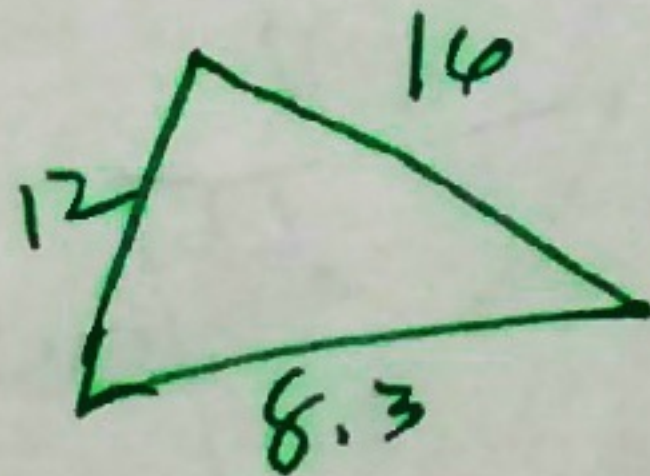
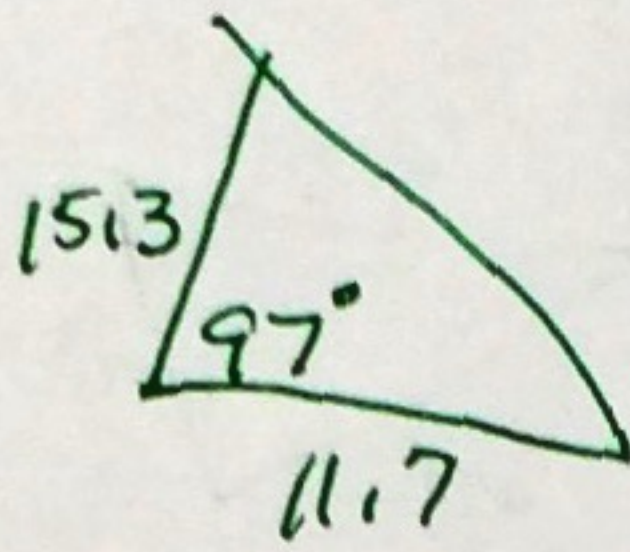|  |  |
|---|---|
|  | <br>B<br><br>5.6<br>120<br>36  24<br>A  8.3  C<br><br>side $\overline{BC}$ |
| B | $\dfrac{\sin 120}{8.3} = \dfrac{\sin 36}{Y}$ <br><br> $X = \dfrac{8.3 \sin 36}{\sin 120}$ <br><br> $X \approx 5.6$ |
| 5.6 | $A = \frac{1}{2}(5.6)(8.3)\sin 24$ <br><br> $A = 9.5$ |
| $9.5 ft^2$ | 16 <br> 12 <br> 8.3 <br><br> $S = 18.15$ <br><br> $K = 48.6 ft^2$ |

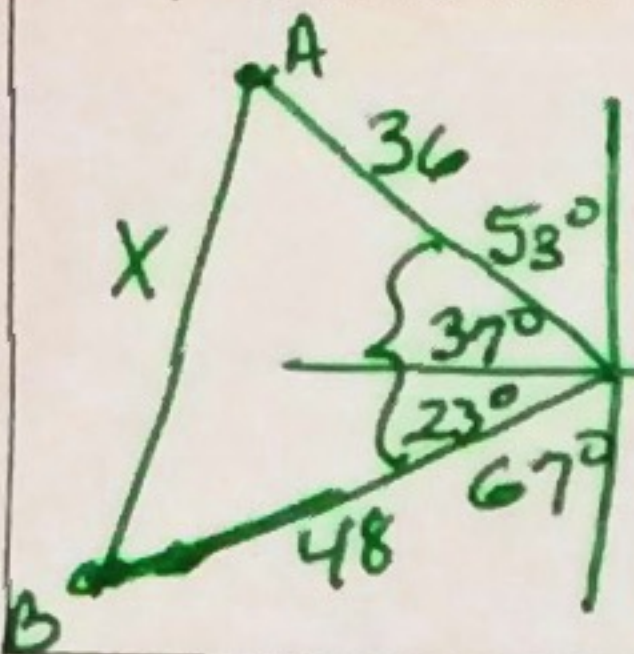| | |
|---|---|
| $48.6 ft^2$ | $A = \frac{1}{2}(15.3)(11.7)\sin 97$<br><br>$\boxed{A = 88.8 ft^2}$<br><br>15.3 / 97° / 11.7 triangle |
| $88.8 ft^2$ | 10.4 / 15.5 / 11.7 triangle<br><br>$s = 18.8$ |
| $18.8$ | $K = \sqrt{18.8(8.4)(3.3)(7.1)}$<br><br>C<br><br>$60.8 ft^2$ |
| C | |
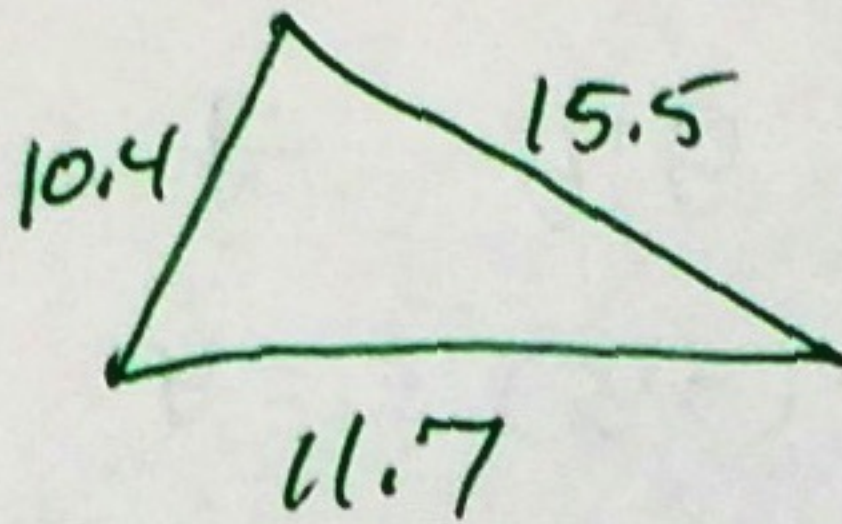
Station 4

Name **Key**

Draw an appropriate picture for each and solve.

**1.** Two ships leave port at 9 AM. One travels at a bearing of N 53° W at 12 mph and the other at a bearing of S 67° W at 16 mph. Approximately how far apart are they at noon that day?

$x^2 = 36^2 + 48^2 - 2(36)(48)\cos 60$

$x \approx 43.3$ miles

**2.** Frank sees a tree in the distance and estimates the angle of elevation to the top to be 51°. He walks 400 feet closer to the tree and estimates the angle of elevation to be 65°. How tall is the tree?

It is a really big tree?!
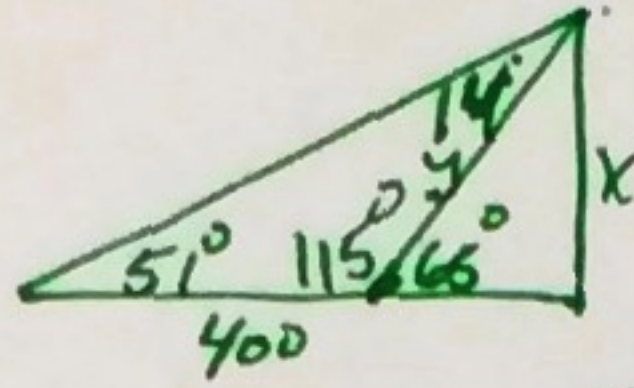
$\frac{\sin 14}{400} = \frac{\sin 51}{y}$

$y = 1284.95$

$\sin 65 = \frac{x}{1284.95}$

$x = 1164$ ft

**3.** A straight tunnel is to be dug through a hill. Two people stand on opposite sides of the hill where the tunnel entrances are to be located. Both can see a stake located 530 meters from the first person and 755 meters from the second. The angle determined by the two people and the stake (the vertex) is 77°. How long must the tunnel be?
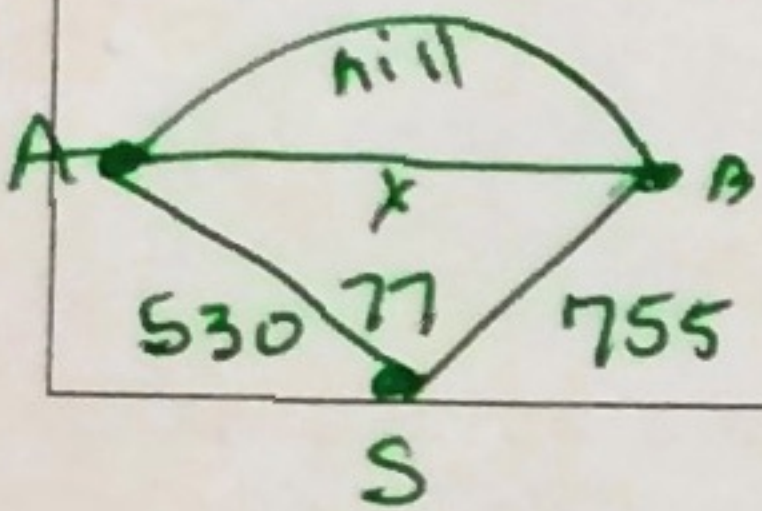
$x^2 = 530^2 + 755^2 - 2(530)(755)\cos 77$

$x \approx 819.1$ M

**4.** A plane flies at a bearing of N 85 W from Chicago. Then takes a bearing of S 25 W for 150 miles. It is then 195 miles from its starting point. How far did the plane fly from Chicago before it made the first turn?
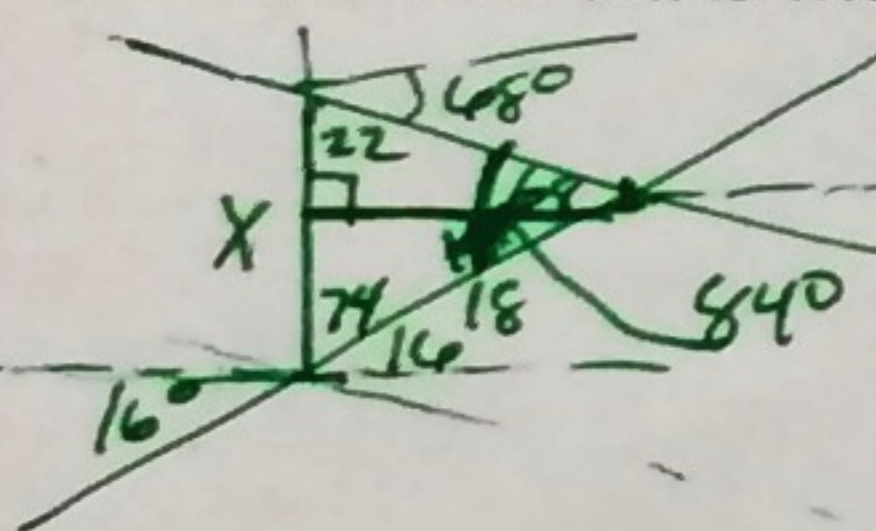
$\frac{\sin 110}{195} = \frac{\sin C}{150}$

$C = 46.3°$

$23.7°$
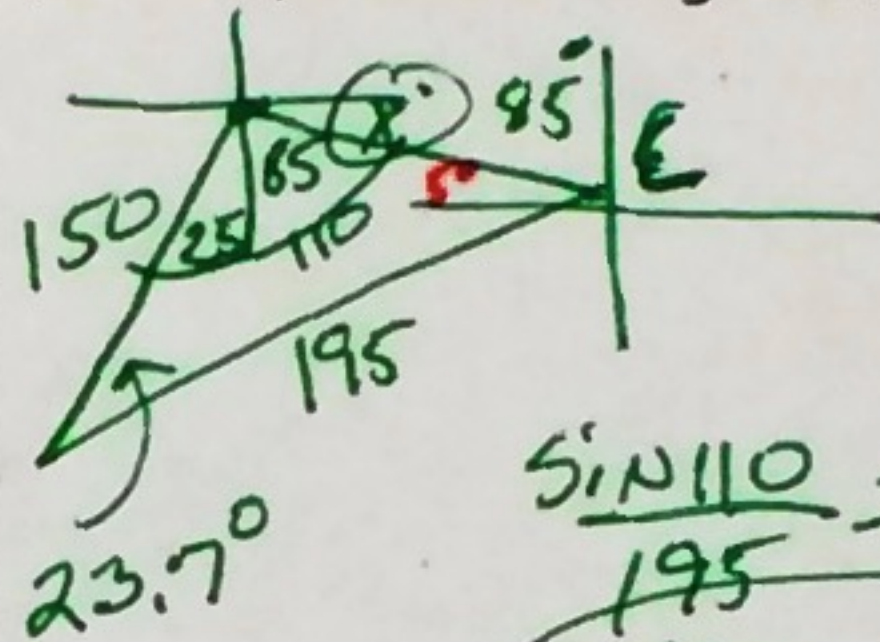
$\frac{\sin 110}{195} = \frac{\sin 23.7}{x}$

$x = 83.4$ miles

**5.** A tree grows vertically on a hillside. The hill is at a 16° angle to the horizontal. The tree casts an 18 meter shadow up the hill when the angle of elevation to the sun is 68°. How tall is the tree?

$\frac{\sin 22}{18} = \frac{\sin 84}{x}$

$x = 47.8$ M

**6.** Captain Smith needs a new sail for his sail boat. The three sides of the sail are 22.7 m, 19.8 m and 12.3 m. Find the area of the sail Captain Smith needs.
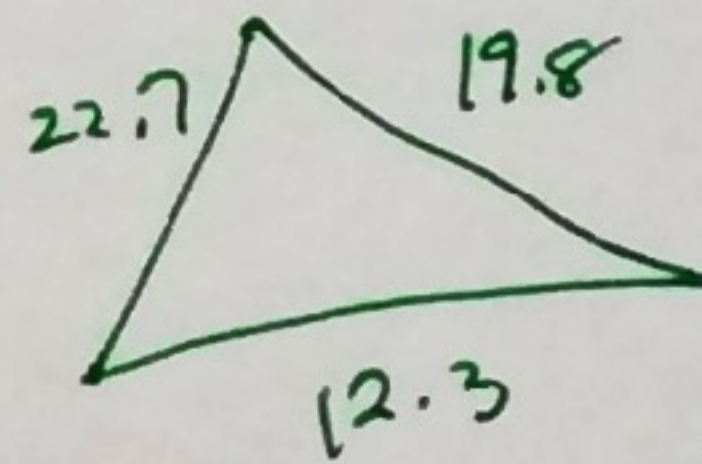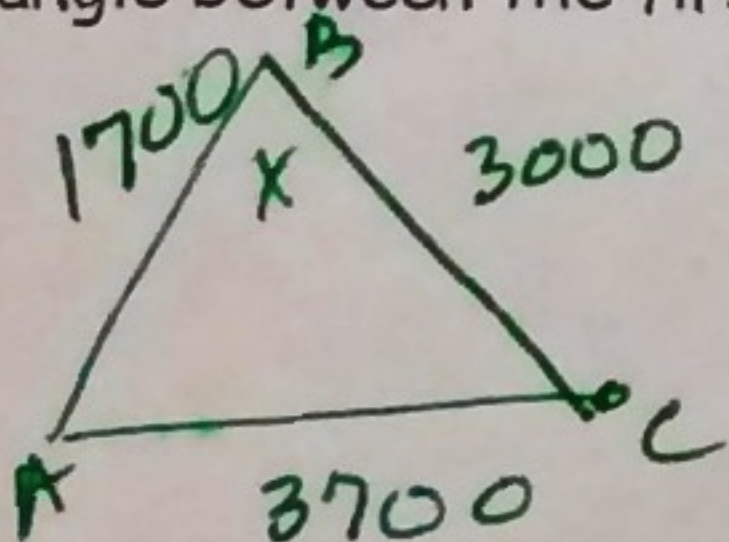
$s = 27.4$

$K = \sqrt{27.4(27.4 - 22.7)(27.4 - 19.8)(27.4 - 12.3)}$

$K = 121.4$ m$^2$

**7.** A boat race runs along a triangular course marked by buoys A, B, and C. The race starts with the boats headed west for 3700 meters. The other two sides of the course lie to the north of the first side, and their lengths are 1700 meters and 3000 meters. Find the angle between the first and second legs of the race.

$x \approx 100.2°$

$\cos x = \frac{1700^2 + 3000^2 - 3700^2}{2(1700)(3000)}$

**8.** A pilot has just started on the glide path for landing at an airport with a runway of 9000 ft. The angles of depression from the plane to the ends of the runway are 17.5° and 18.8°. Find the air distance the plane must travel until touching down on the near end of the runway.
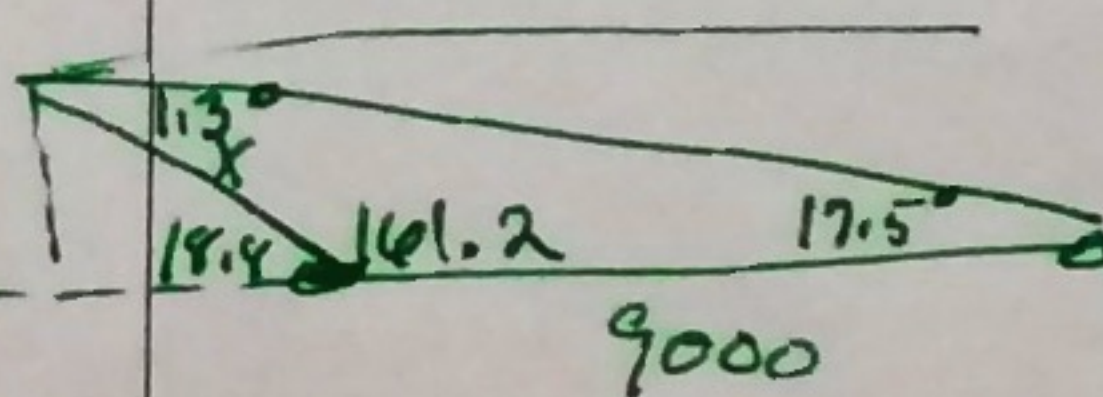
$\frac{\sin 1.3}{9000} = \frac{\sin 17.5}{x}$

$x \approx 119,289.1$ ft

or 22.6 miles