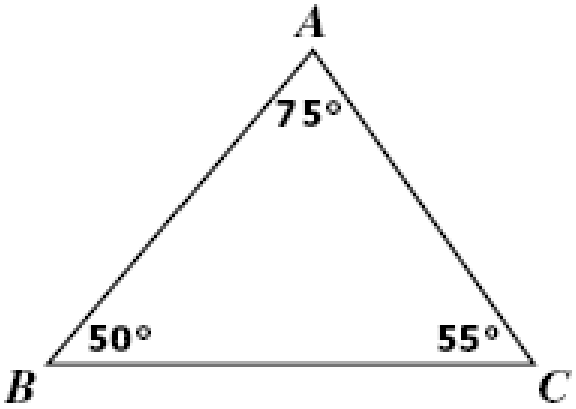
Modified and Animated By Chris Headlee
Nov 2011

CHAPTER 5 SOL PROBLEMS

SSM: Super Second-grader Methods

SOL Problems; not Dynamic Variable Problems



SSM:
- measure sides with scrap paper
- AC is shortest
- BC is longest

Which list has the sides of $\triangle ABC$ ordered from longest to shortest?

F $\overline{BC}, \overline{AC}, \overline{AB}$

G $\overline{AB}, \overline{AC}, \overline{BC}$

H $\overline{AC}, \overline{AB}, \overline{BC}$

J $\overline{BC}, \overline{AB}, \overline{AC}$

Order the measures of angles from largest to smallest: 75 > 55 > 50
Replace with the letter of the angles $\angle A > \angle C > \angle B$
Put in the missing letters of the triangle BC > AB > AC
Now the sides are ordered from longest to shortest: BC > AB > BD

21 Three survey markers are located on a map at points H, I, and J. A triangle is formed by connecting these markers by string so that $HI = 150$ feet, $HJ = 245$ feet, and $IJ = 365$ feet.

Which statement is true about the measures of the angles of $\triangle HIJ$?

A $m\angle H$ is the smallest

B $m\angle H$ is the largest

C $m\angle I$ is the smallest

D $m\angle I$ is the largest

SSM:

- **largest angle opposite largest side**

Order the measures of sides from smallest to largest: 150 < 245 < 365

Replace with the letters of the sides HI < HJ < IJ

Put in the missing letters of the triangle $\angle J < \angle I < \angle H$

Now the angles are ordered from smallest to largest: $\angle J < \angle I < \angle H$

23 Two sides of a triangle measure 14 inches and 8 inches. Which *cannot* be the length of the remaining side?

A 6 in.
B 8 in.
C 14 in.
D 21 in.

SSM:
- **any two sides bigger than 3rd**

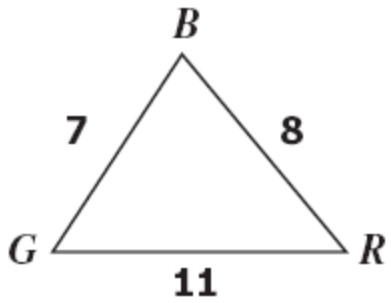
third side must:

$14 - 8 < 3^{rd}\ side < 14 + 8$

$6 < 3^{rd}\ side < 22$

all answers except A fit inequality above

14 In the triangle shown, $GR = 11$, $BR = 8$, and $BG = 7$.



Which statement is true about the angles in $\triangle RGB$?

F $m\angle R$ is the greatest
G $m\angle G$ is the greatest
H $m\angle R$ is the least
J $m\angle G$ is the least

SSM:

- **Remember the virtual alligator largest stick → largest mouth**

Order the measures of sides from largest to smallest: 11 > 8 > 7
Replace with the letter of the sides GR > BR > BG
Put in the missing letter of the triangle B > G > R
Now the angles are ordered from largest to smallest: ∠B > ∠G > ∠R

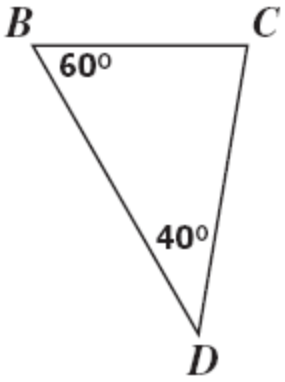
18 **John wants to make a triangular garden. Which of the following are possible dimensions?**

F 4 ft by 5 ft by 10 ft
G 6 ft by 6 ft by 12 ft
H 6 ft by 8 ft by 10 ft
J 8 ft by 12 ft by 20 ft

SSM:
- **try and graph it on graph paper**

Take the smallest two numbers
add them together
if they are greater than the third,
then we can have a triangle

21



SSM:
- Measure the sides with ruler or scrap paper
- BC is the shortest
- BD the longest

Which lists the sides of $\triangle BCD$ in order from shortest to longest?

A $\overline{CD}, \overline{BD}, \overline{BC}$

B $\overline{BC}, \overline{CD}, \overline{BD}$

C $\overline{BD}, \overline{CD}, \overline{BC}$

D $\overline{BC}, \overline{BD}, \overline{CD}$

Order the measures of angles from smallest to largest: 40 < 60 < 80
Replace with the letter of the angles ∠D < ∠B < ∠C
Put in the missing letters of the triangle BC < CD < BD
Now the sides are ordered from smallest to largest: BC < CD < BD

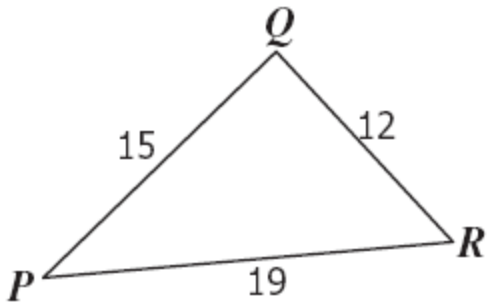
15 **Which pipe lengths could be joined to form a triangle?**

A 15 ft, 6 ft, 5 ft
B 13 ft, 12 ft, 5 ft
C 40 ft, 20 ft, 10 ft
D 19 ft, 16 ft, 2 ft

SSM:
- **same procedures as normal**

Take the smallest two numbers
add them together
if they are greater than the third,
then we can have a triangle

18



SSM:

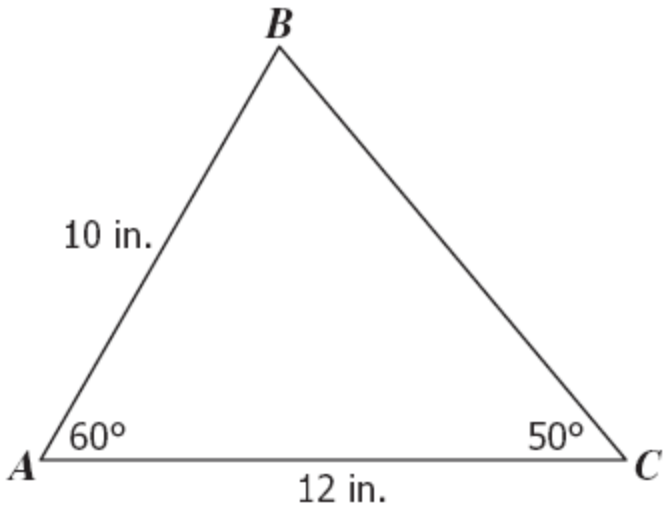
- **Remember the virtual alligator largest stick → largest mouth**

Which lists the angles of the triangle in order from least to greatest?

F $\angle R, \angle Q, \angle P$
G $\angle Q, \angle P, \angle R$
H $\angle P, \angle R, \angle Q$
J $\angle P, \angle Q, \angle R$

Order the measures of sides from smallest to largest: 12 < 15 < 19
Replace with the letter of the sides QR < PQ < PR
Put in the missing letter of the triangle P < R < Q
Now the angles are ordered from largest to smallest: ∠P < ∠R < ∠Q

19 **Jennifer made these measurements on $\triangle ABC$. BC must be —**



SSM:

- **Use ruler or scrap paper to measure AB and estimate BC**

A less than 10 inches
B between 10 and 12 inches
C between 12 and 22 inches
D greater than 22 inches

Angles: A = 60, C = 50 and B must be 70 (3 angles = 180)

Since BC is opposite the 60° angle it is the middle length side, and must be between 10 (smallest) and 12 (longest)

18 **Which of the following could *not* be the lengths of the sides of a triangle?**

F 6 ft, 3 ft, 9 ft
G 3 cm, 4 cm, 5 cm
H 4 in., 6 in., 8 in.
J 5 km, 2 km, 4 km

SSM:
- **not → 3 triangles and one not**

two smallest sides added together > biggest side

A fails because its two smallest sides = biggest side

19 In $\triangle DEF$, m$\overline{DE}$ = 8 inches, m$\overline{EF}$ = 6 inches, and m$\overline{DF}$ = 10 inches. Which lists the angles in order from *smallest* to *largest*?

A $\angle D, \angle E, \angle F$

B $\angle F, \angle D, \angle E$

C $\angle E, \angle F, \angle D$

D $\angle D, \angle F, \angle E$

SSM:

- **virtual alligator**
- **Largest stick → largest angle**
- **DF is biggest so ∠E is biggest**
- **EF is smallest so ∠D is smallest**

Arrange sides from smallest to largest based on numbers
6, 8, 10
Substitute the side's names (line segments)
EF, DE, DF
Put in missing letter from triangle
D, F, E
Angles are now from smallest to largest

20 In $\triangle ABC$, if $m\angle C < m\angle B < m\angle A$, then —

F $AB < AC < BC$

G $AC < AB < BC$

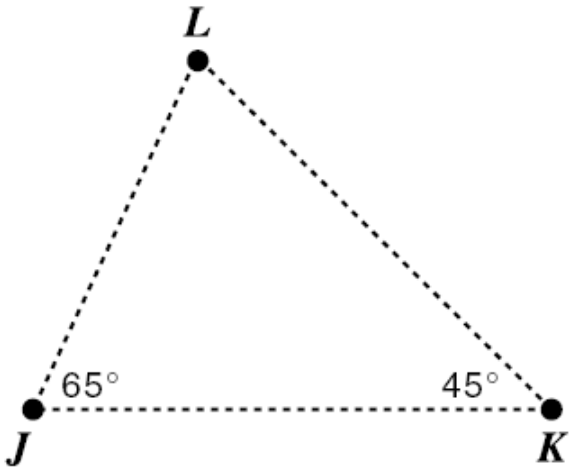
H $AB < BC < CA$

J $BC < AB < CA$

SSM:
- **virtual alligator**
- **Largest angle → largest stick**
- **∠A is biggest so BC is biggest**
- **∠C is smallest so AB is smallest**

Arrange angles from smallest to largest based on given
C, B, A
Put in missing letters from triangle
AB, AC, BC
Sides are now from smallest to largest

18 **Three boys are in a field flying kites. Viewed from above, the angle at Kyle, *K*, measures 45°, and the angle at Jake, *J*, measures 65°.**



Which shows the distances between the boys in order from least to greatest?

F *LJ, JK, KL*

G *KL, KJ, LJ*

H *KJ, LK, JL*

J *LJ, LK, JK*

SSM:

- **Measure the sides with ruler or scrap paper**
- **LJ is the shortest**
- **JK the longest**

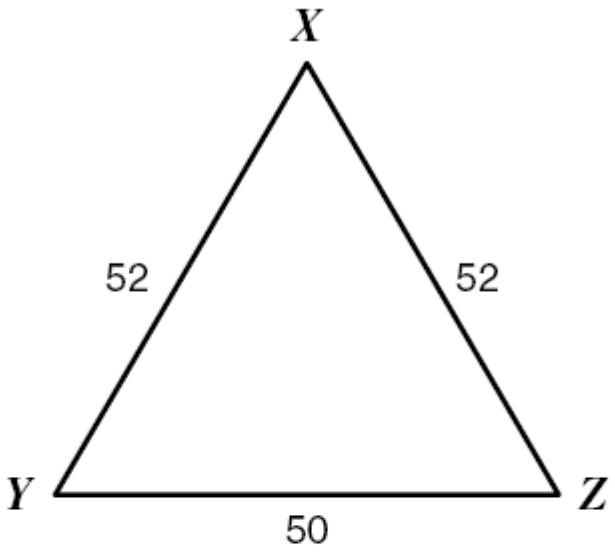
Order the measures of angles from smallest to largest: 45 < 65 < 70

Replace with the letter of the angles ∠K < ∠J < ∠L

Put in the missing letters of the triangle LJ < LK < JK

Now the sides are ordered from smallest to largest: LJ < LK < JK

19



Using the information in the drawing, which angle has the least measure?

A $\angle XZY$

B $\angle XYZ$

C $\angle ZXY$

D $\angle YZX$

SSM:

- **virtual alligator**
- **smallest angle is opposite the smallest angle**

smallest side, 50, is opposite the smallest angle, $\angle X$ or $\angle ZXY$

20 Which of the following could *not* be the lengths of the sides of a triangle?

F 8 in., 19 in., 15 in.

G 6 in., 3 in., 9 in.

H 4 in., 5 in., 6 in.

J 10 in., 8 in., 9 in.

SSM:

- **try and graph it on graph paper**

Take the smallest two numbers
add them together
if they are greater than the third,
then we can have a triangle

Three will work and one will not

18 **Which list could *not* be the measures of lengths of the three sides of a given triangle?**

F 5 cm, 12 cm, 15 cm

G 2 ft, 6 ft, 5 ft

H 11 mi, 4 mi, 12 mi

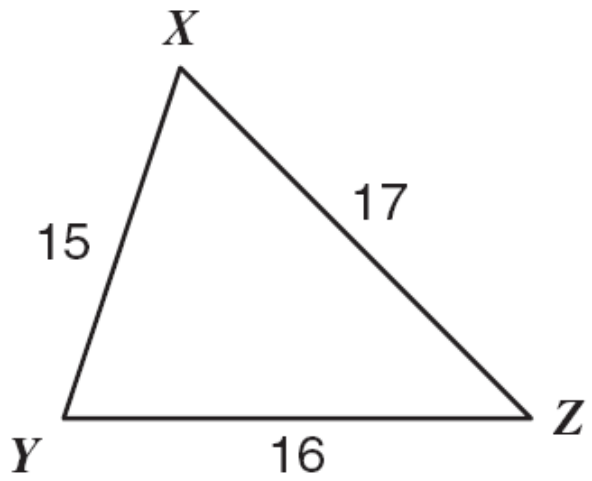
J 12 yd, 35 yd, 20 yd

SSM:
- **three work**
- **one does not**

Take the smallest two numbers
add them together
if they are greater than the third,
then we can have a triangle

J does not work

19



SSM:

- **Remember the virtual alligator smallest stick → smallest mouth**

In the drawing of triangle *XYZ*, which angle has the least measure?

A All angles have the same measure.

B $\angle XYZ$

C $\angle ZXY$

D $\angle XZY$

Order the measures of sides from smallest to largest:

15 < 16 < 17

Replace with the letter of the sides

XY < YZ < XZ

Put in the missing letter of the triangle

Z < X < Y

Now the angles are ordered from smallest to largest:

$\angle Z < \angle X < \angle Y$

20 If $m\angle A = 65°$, $m\angle B = 15°$, $m\angle C = 100°$, which lists the sides of the triangle in order from shortest to longest?

F $\overline{AC}, \overline{AB}, \overline{BC}$

G $\overline{BA}, \overline{BC}, \overline{AC}$

H $\overline{BA}, \overline{AC}, \overline{BC}$

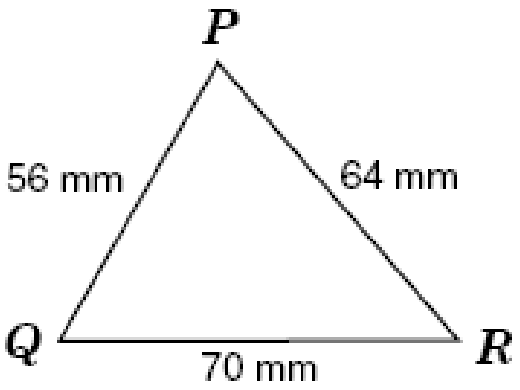
J $\overline{AC}, \overline{BC}, \overline{BA}$

SSM:

- **Remember the virtual alligator smallest stick → smallest mouth**

Order the measures of angles from smallest to largest:
15 < 65 < 100
Replace with the letter of the angles
B < A < C
Put in the missing letters of the triangle
AC < BC < AB
Now the sides are ordered from smallest to largest:
AC < BC < AB

18



SSM:

- virtual alligator
- Largest stick → largest angle
- QR is biggest so ∠P is biggest
- PQ is smallest so ∠R is smallest

From smallest to largest, the angles of ΔPQR are —

F $\angle R, \angle Q, \angle P$

G $\angle R, \angle P, \angle Q$

H $\angle Q, \angle R, \angle P$

J $\angle P, \angle R, \angle Q$

Arrange sides from smallest to largest based on numbers
56, 64, 70

Substitute the side's names (line segments)
PQ, PR, QR

Put in missing letter from triangle
R, Q, P

Angles are now from smallest to largest

19 **Which set of lengths could *not* be the lengths of the sides of a triangle?**

A 7 in., 24 in., 30 in.

B 8 ft, 10 ft, 12 ft

C 4 cm, 5 cm, 9 cm

D 2 m, 3 m, 4 m

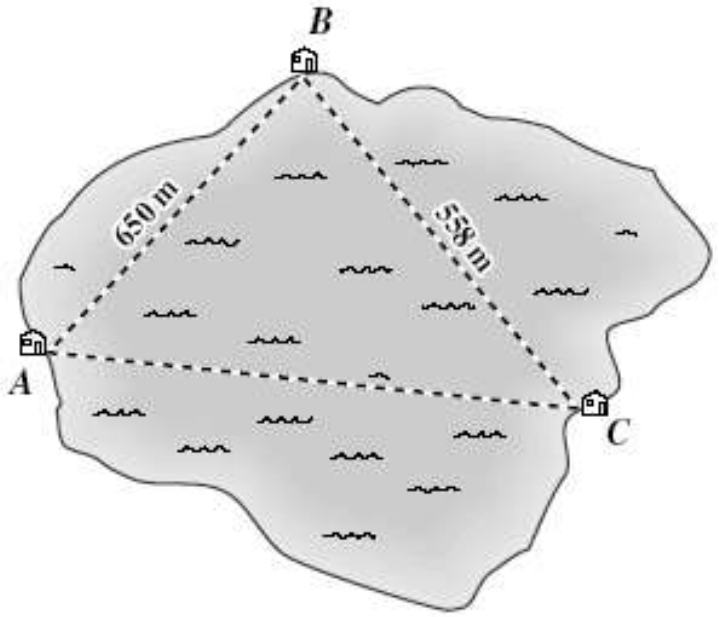
SSM:

- **not → 3 triangles and one not**

two smallest sides added together > biggest side

C fails because its two smallest sides = biggest side

20



The locations of three water pumping stations form a triangle on a map of the area. The distance from station *A* to station *B* is 650 meters. The distance from station *B* to station *C* is 558 meters. The distance from station *A* to station *C* is —

F less than 92 m
G exactly 92 m
H between 92 m and 1,208 m
J greater than 1,208 m

SSM:

- by looks AC is biggest side so its got to be bigger than 650
- this eliminates F and G

two smallest sides added together > biggest side
if AC is biggest then AC < 1208 (650+558)
if AC is smallest then AC > 92 (650-558)

19 In triangle ABC, $AC = 6$, $AB = 7$, and $BC = 5$. Which is true?

A The measure of $\angle C$ is the least of the three angles.

B The measure of $\angle C$ is the greatest of the three angles.

C The measure of $\angle B$ is the greatest of the three angles.

D The measure of $\angle B$ is the least of the three angles.

SSM:

- **Remember the virtual alligator largest stick → largest mouth**

Order the measures of sides from smallest to largest: $5 < 6 < 7$

Replace with the letter of the sides $BC < AC < AB$

Put in the missing letter of the triangle $A < B < C$

Now the angles are ordered from largest to smallest: $\angle A < \angle B < \angle C$

20 In any ΔABC, which statement is always true?

F $m\angle A + m\angle B = 90°$

G $m\angle A + m\angle B < 90°$

H $AB + BC > AC$

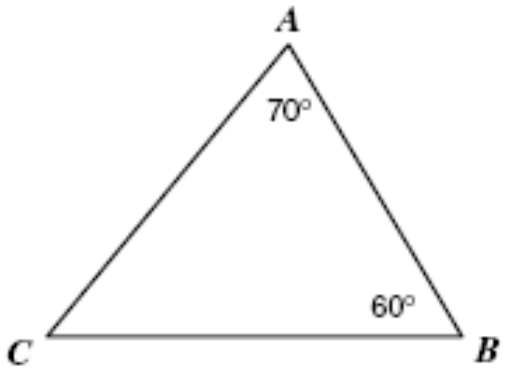
J $AB + BC < AC$

SSM:

- **not much help**

Any two sides of a triangle must be bigger than the third

21



Which of the following lists the sides of ΔABC from least to greatest length?

A $\overline{AC}, \overline{BC}, \overline{AB}$

B $\overline{AC}, \overline{AB}, \overline{BC}$

C $\overline{AB}, \overline{AC}, \overline{BC}$

D $\overline{BC}, \overline{AC}, \overline{AB}$

SSM:

- **Remember the virtual alligator largest stick → largest mouth**

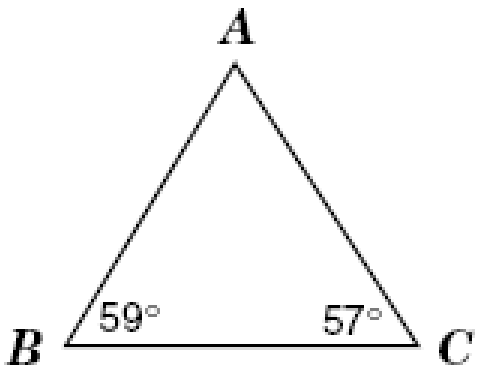
Order the measures of angles from smallest to largest: 50 < 60 < 70

Replace with the letter of the angles C < B < A

Put in the missing letters of the triangle AB < AC < BC

Now the sides are ordered from largest to smallest: AB < AC < BC

17



SSM:

- **Remember the virtual alligator largest stick → largest mouth**

From shortest to longest, the sides of ΔABC are —

A $\overline{AC}, \overline{BC}, \overline{AB}$

B $\overline{AB}, \overline{BC}, \overline{AC}$

C $\overline{BC}, \overline{AC}, \overline{AB}$

D $\overline{AB}, \overline{AC}, \overline{BC}$

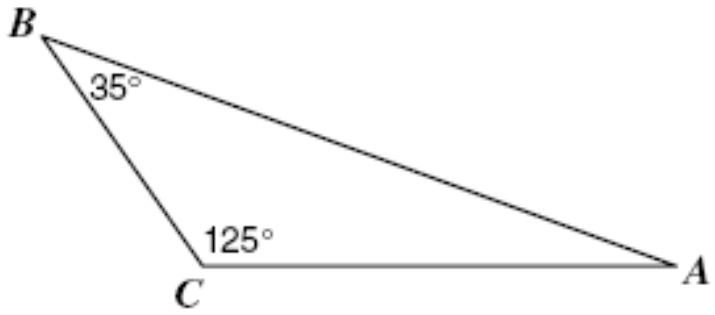
Order the measures of angles from smallest to largest: 57 < 59 < 64

Replace with the letter of the angles C < B < A

Put in the missing letters of the triangle AB < AC < BC

Now the sides are ordered from largest to smallest: AB < AC < BC

18 In the drawing, the measure of $\angle C = 125°$ and the measure of $\angle B = 35°$.



Which is the shortest side of the triangle?

F $\overline{AC}$

G $\overline{AB}$

H $\overline{EB}$

J $\overline{BC}$

SSM:

- **Remember the virtual alligator smallest stick → smallest mouth**

Order the measures of angles from smallest to largest: 20 < 35 < 125

Replace with the letter of the angles A < B < C

Put in the missing letters of the triangle BC < AC < AB

Now the sides are ordered from largest to smallest: BC < AC < AB

19 On a map, Tannersville, Chadwick, and Barkersville form a triangle. Chadwick is 70 miles from Tannersville and Barkersville is 90 miles from Tannersville. Which is a possible distance between Chadwick and Barkersville?

A 5 miles
B 10 miles
C 150 miles
D 200 miles

SSM:

- **Use ruler or scrap paper to measure AB and estimate BC**

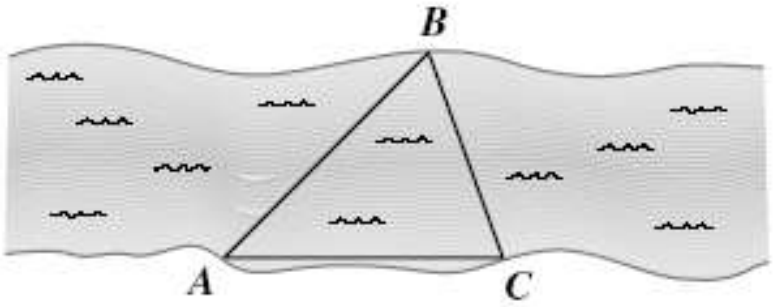
To make a triangle any two sides has to be greater than the third side

the distance between Chadwick and Barkersville has to be between:

90 – 70 = 20 and 90 + 70 = 160

only answer C is 20 < distance < 160

16 On the shores of a river, surveyors marked locations, A, B, and C. The measure of $\angle ACB = 70°$, and the measure of $\angle ABC = 65°$.



Which lists the distances between these locations in order, least to greatest?

F A to B, B to C, A to C
G B to C, A to B, A to C
H B to C, A to C, A to B
J A to C, A to B, B to C

SSM:

- **Remember the virtual alligator largest stick → largest mouth**

Order the measures of angles from smallest to largest: 45 < 65 < 70
Replace with the letter of the angles A < B < C
Put in the missing letters of the triangle BC < AC < AB
Now the sides are ordered from largest to smallest: BC < AC < AB

18 **Which of the following could be the lengths of the sides of ΔABC?**

F $AB = 12, BC = 15, AC = 2$

G $AB = 9, BC = 15, CA = 4$

H $AB = 150, BC = 100, CA = 50$

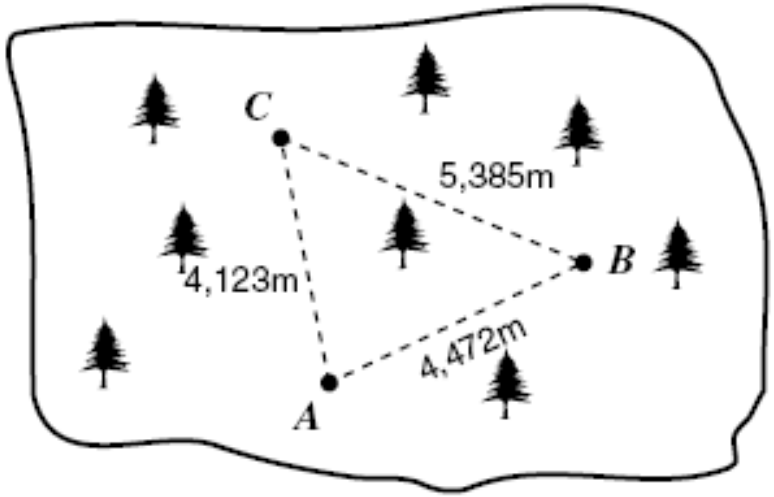
J $AB = 10, BC = 8, AC = 12$

SSM:
- **three can't and only one works**

Take the smallest two numbers
add them together
if they are greater than the third,
then we can have a triangle

answers F, G and H all fail the test

19 Three lookout towers are located at points A, B, and C on the section of a national forest shown in the drawing.



Which of the following statements is true concerning ΔABC formed by the towers?

A $m\angle A$ is greatest.
B $m\angle C$ is greatest.
C $m\angle A$ is least.
D $m\angle C$ is least.

SSM:

- **Remember the virtual alligator largest stick → largest mouth**

Order the sides from smallest to largest:

4,123 < 4,472 < 5,385

Replace with the letter of the sides

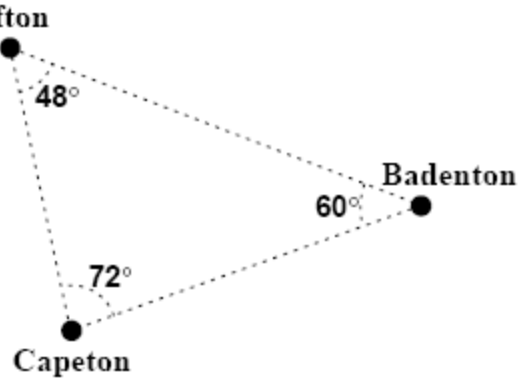
AC < AB < BC

Put in the missing letter of the triangle

B < C < A

angles from largest to smallest:

∠B < ∠C < ∠A

17 

Three towns form a triangle on a map. The angle formed at the point designating Afton is 48°, at Badenton 60°, and at Capeton 72°. Which lists the distances between towns in order, *greatest* to *least*?

A Afton to Badenton, Badenton to Capeton, Afton to Capeton

B Afton to Badenton, Afton to Capeton, Badenton to Capeton

C Afton to Capeton, Afton to Badenton, Badenton to Capeton

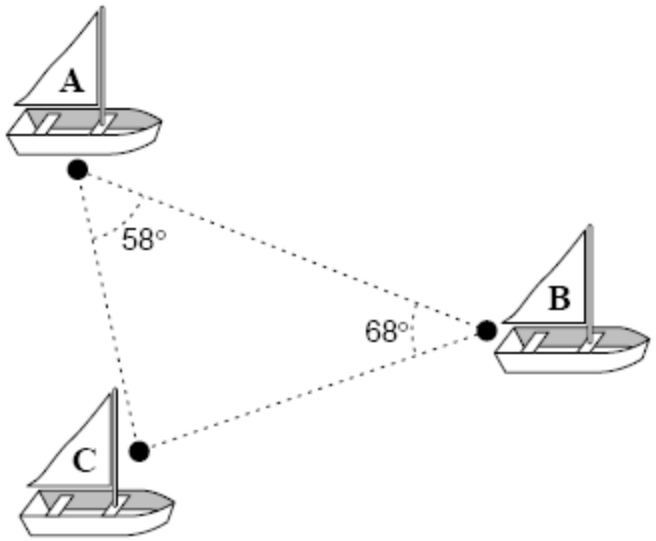
D Badenton to Capeton, Afton to Badenton, Afton to Capeton

SSM:

- **virtual alligator**
- **Largest stick → largest angle**
- **∠ C is biggest so AB is biggest**
- **∠A is smallest so BC is smallest**

Arrange angles from greatest to least
72, 60, 48
Substitute the angle's names
C, B, A
Put in missing letters from triangle
AB, AC, BC
Sides are now from greatest to least

18



Three boats are anchored in a bay. Given the information in the diagram, which of the following statements concerning the distances between the boats is true?

F $AC < AB$

G $BC < AB$

H $AB < AC$

J $AC < BC$

SSM:

- not to scale!!!
- virtual alligator
- Largest stick → largest angle
- ∠ C is smallest so AB is smallest
- ∠B is biggest so AC is largest

Missing angle: 180 – (58+68) = 54

Arrange angles from greatest to least

68, 58, 54

Substitute the angle's names

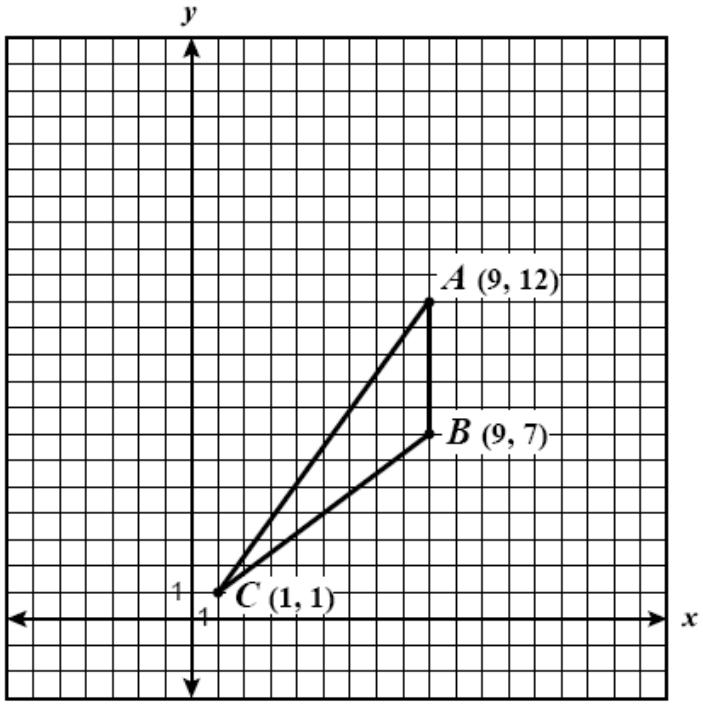
B, A, C

Put in missing letters from triangle

AC, BC, AB

Sides are now from greatest to least

19



Erica plotted the 3 towns closest to her house on a graph with town A at (9, 12), town B at (9, 7) and town C at (1, 1). She drew the triangle joining the 3 points. Which lists the angles formed in size, smallest to largest?

A $\angle A, \angle B, \angle C$

B $\angle B, \angle C, \angle A$

C $\angle C, \angle A, \angle B$

D $\angle B, \angle A, \angle C$

Arrange sides from smallest to largest
AB, BC, AC
Put in missing letter from triangle
C, A, B
Angles are now from smallest to largest

SSM:
- **virtual alligator**
- **Largest stick → largest angle**
- **∠B is biggest (its obtuse!)**