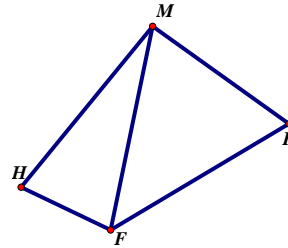


Please complete the following problems neatly on your own paper. Show all your work and circle your answers. Transfer your answers for each question to the answer sheet provided. You will turn in both the answer sheet and your work.

1. Complete the proof:
 Given: $\overline{HM} \cong \overline{MF} \cong \overline{FK}$, $\angle MHF \cong \angle FMK$
 Prove: $\angle HFM \cong \angle FKM$



Statements	Reasons
1. $\overline{HM} \cong \overline{MF} \cong \overline{FK}$	1. Given
2. $\triangle HMF$ is an isosceles triangle, $\triangle MFK$ is an isosceles triangle	2. Definition of isosceles triangle
3. $\angle MHF \cong \angle HFM$, $\angle FMK \cong \angle FKM$	3. _____
4. $\angle MHF \cong \angle FMK$	4. _____
5. _____	5. _____

2. "If you are 13 years old, then you are a teenager."
 Which of the following is the inverse of that statement?
- A. If you are a teenager, then you are 13 years old.
 - B. If you are not a teenager, then you are not 13 years old.
 - C. If you are not 13 years old, then you are not a teenager.
 - D. You are 13 years old if and only if you are a teenager.
 - Determine whether the inverse is true or false. Explain.
3. Which statement is logically equivalent to "If it is snowing, then I go sledding"?
- A. If I go sledding, then it is snowing.
 - B. If it is snowing, then I do not go sledding.
 - C. If I do not go sledding, then it is not snowing.
 - D. If it is not snowing, then I do not go sledding.

4. Mr. Brown writes following statement:
 "If two triangles have the same perimeter, then they are congruent."

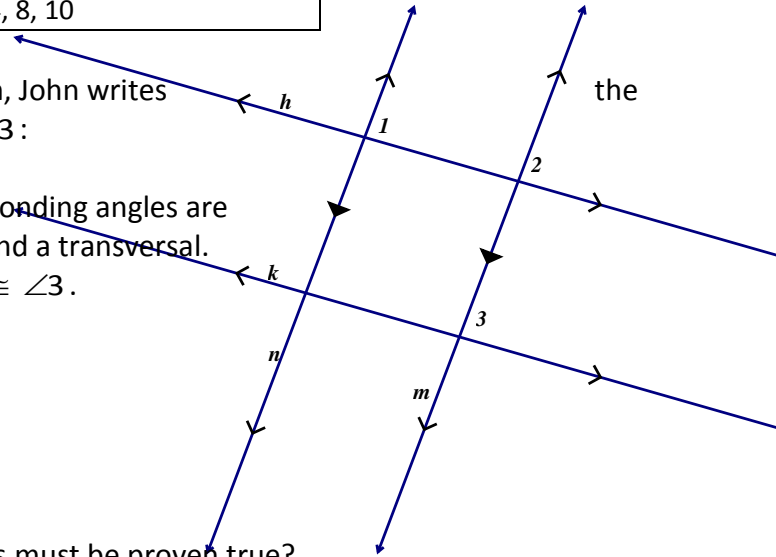
Which of the following is a counter-example for Mr. Brown's statement?

	Side lengths of $\triangle JKL$	Side lengths of $\triangle RQT$
<input type="radio"/> A.	4, 8, 9	4, 8, 9
<input type="radio"/> B.	4, 8, 9	5, 7, 9
<input type="radio"/> C.	4, 8, 9	5, 8, 10
<input type="radio"/> D.	4, 8, 9	4, 8, 10

5. Using the information given in the diagram, John writes following argument to show that $\angle 1 \cong \angle 3$:

$\angle 1 \cong \angle 2$ and $\angle 2 \cong \angle 3$ because corresponding angles are congruent when formed by parallel lines and a transversal. Therefore by the transitive property, $\angle 1 \cong \angle 3$.

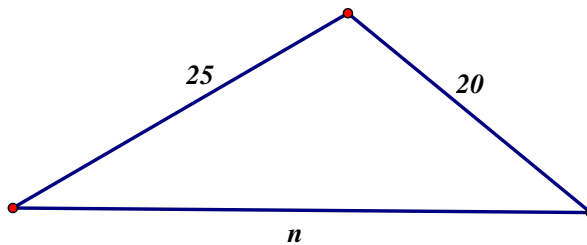
Identify the error in John's reasoning.



6. Which of the following types of statements must be proven true?
- A. Definitions
 - B. Postulates
 - C. Theorems
 - D. Undefined terms

7. In the triangle shown, n is a whole number. What is the greatest possible value for n ?

- A. 1
- B. 5
- C. 40
- D. 44

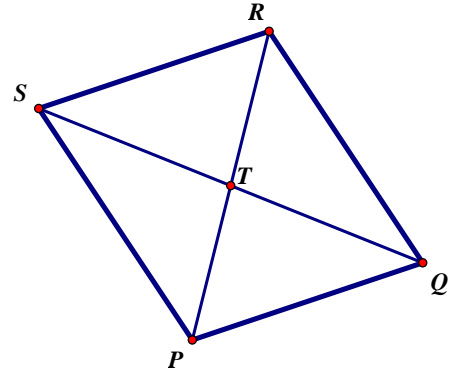


8. An obtuse isosceles triangle has one angle that measures 22° . Determine the measure of the obtuse angle.

9. Which lines would be constructed in a triangle if you wanted to find the center of a circle that is inscribed in the triangle?
- A. Altitudes
 - B. Angle bisectors
 - C. Medians
 - D. Perpendicular bisectors

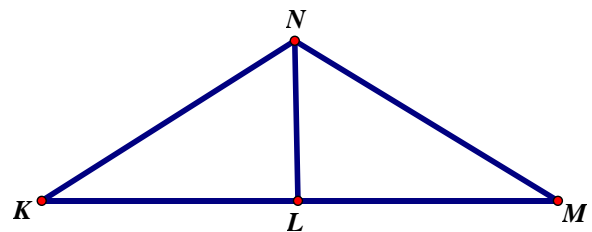
10. Suppose you wanted to prove that $\angle RSP \cong \angle PQR$ by first showing that two triangles containing those angles are congruent. Which two triangles would you want to prove congruent?

- A. $\triangle RSP \cong \triangle QPS$
- B. $\triangle RST \cong \triangle PQT$
- C. $\triangle PSR \cong \triangle RQP$
- D. $\triangle RTQ \cong \triangle PTS$



11. Given: \overline{NL} bisects $\angle KNM$, $\overline{NK} \cong \overline{NM}$,
 Prove: $\triangle KLN \cong \triangle MLN$

Complete the proof:



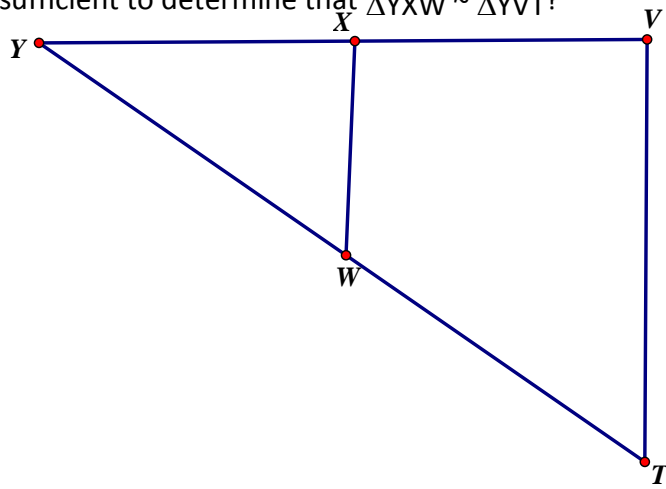
\overline{NL} bisects $\angle KNM$	\longrightarrow	$\angle KNL \cong \angle MNL$		
Given		Definition of angle bisector		
$\overline{NK} \cong \overline{NM}$	\longrightarrow	2.		
Given				
1.	\longrightarrow	3.		
Reflexive property				

12. Which triangles must be similar?
- A. Two right triangles
 - B. Two obtuse isosceles triangles
 - C. Two right isosceles triangles
 - D. Two scalene triangles

13.

What information would be sufficient to determine that $\triangle YXW \sim \triangle YVT$?

- A. $2YW = YT$
- B. $\overline{VX} \cong \overline{XY}$
- C. $\overline{YV} \perp \overline{VT}$
- D. $\overline{XW} \parallel \overline{VT}$



14.

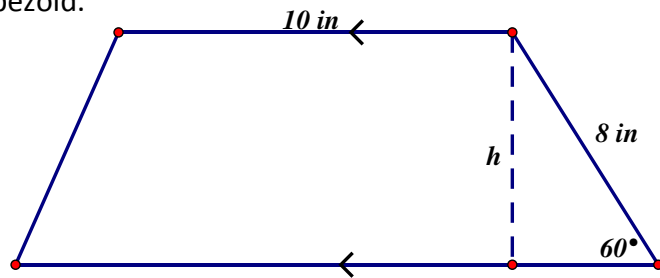
The diagonal of a square is 20 inches long. Determine the area of the square.

Area of square: _____ square inches

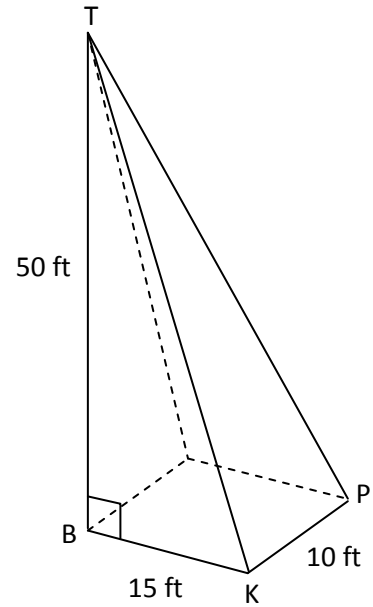
15.

Determine the height of the trapezoid.

- A. 4 inches
- B. $4\sqrt{2}$ inches
- C. $4\sqrt{3}$ inches
- D. 8 inches

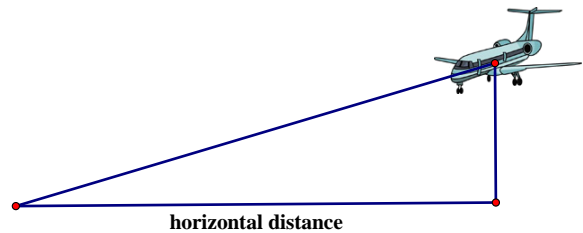


16. An art sculpture has the shape of a pyramid with a rectangular base, as shown, with \overline{BT} perpendicular to \overline{BK} . Find the length of \overline{TP} .



17. Sam is building walls for a garage. One wall is 20 ft long and 15 feet tall. The wall looks rectangular, but to be sure, Sam measures the diagonal of the wall and finds it is 24 ft. 4 inches long. Determine whether the wall a rectangle. Explain your reasoning.

18. An air traffic controller sees a jet flying at an altitude of 30,000 feet. The air traffic controller measures the angle of elevation to the plane to be 16.5° . Find the horizontal distance of the plane to the airport, to the nearest foot.



19. In the figure, if $\sin x = 10/26$, determine $\cos x$.



20. 3.E Two support wires will be attached to a phone tower as shown in the figure below. The tower is 65 ft. tall. One wire will be attached at Point A and the second at Point B which is 10 ft. farther away from the tower. The wire at Point A makes an angle of 63° with the ground. What angle is formed by the wire attached at Point B and the ground? Answer to the nearest whole degree.

