

Practice Exam Winter

Indicate the answer choice that best completes the statement or answers the question.

Questions 1 & 2: Refer to Figure 1.

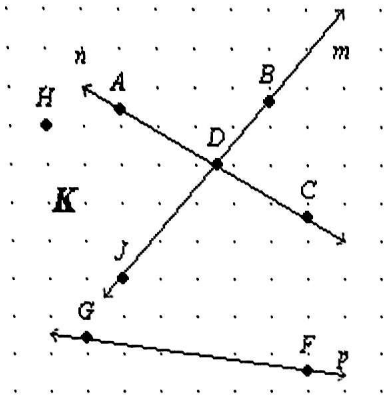
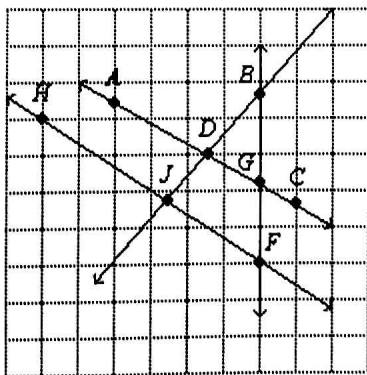


Figure 1

- ___ 1. Name a line that contains point *A*.
 a. \overleftrightarrow{DC} b. *m*
 c. ***K*** d. *DB*

- ___ 2. Name a point NOT contained in \overleftrightarrow{AD} or \overleftrightarrow{FG} .
 a. ***K*** b. *A*
 c. *H* d. *D*

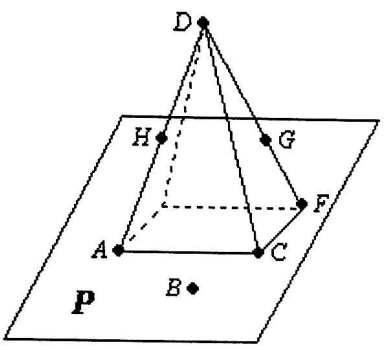
- ___ 3. Name three points that are collinear.



- a. *B, J, H* b. *D, C, F*
 c. *B, D, A* d. *D, G, C*

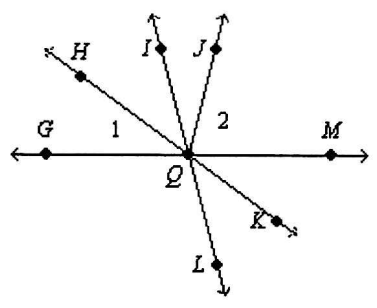
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___ 4. Are points $A, C, D,$ and F coplanar? Explain.



- a. Yes; they all lie on plane P .
- b. No; they are not on the same line.
- c. No; three lie on the same face of the pyramid and the fourth does not.
- d. Yes; they all lie on the same face of the pyramid.

Use the figure to find the angles.



- ___ 5. Name two obtuse vertical angles.
- a. $\angle KQL, \angle KQM$
 - b. $\angle KQL, \angle IQH$
 - c. $\angle GQI, \angle IQM$
 - d. $\angle HQL, \angle IQK$

Make a conjecture about the next item in the sequence.

- ___ 6. 6, 9, 7, 10, 8
- a. 9
 - b. 11
 - c. 6
 - d. 10

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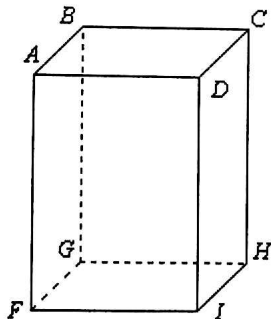
Determine whether the conjecture is true or false.

- ___ 7. **Given:** a concave polygon
Conjecture: It can be regular or irregular.
 a. False; to be concave the angles cannot be congruent.
 b. True
 c. False; all concave polygons are regular.
 d. False; a concave polygon has an odd number of sides.
- ___ 8. **Given:** points $R, S,$ and T
Conjecture: $R, S,$ and T are coplanar.
 a. False; the points do not have to be in a straight line.
 b. True
 c. False; the points do not have to form right angles.
 d. False; one point may not be between the other two.

Write the statement in if-then form.

- ___ 9. Perpendicular lines intersect to form right angles.
 a. If the lines intersect to form right angles, then the lines intersect to form right angles.
 b. If the lines are perpendicular, then the lines are perpendicular.
 c. If the lines intersect to form right angles, then the lines are perpendicular.
 d. If the lines are perpendicular, then the lines intersect to form right angles.

Refer to the figure below.



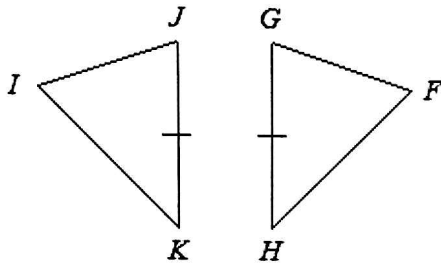
- ___ 10. Name all planes intersecting plane CHG .
 a. BAD, CDI, FID, BGF b. CBA, CDI, FIH, BAF
 c. ADC, DIH, FIH, CHI d. CDA, DAF, FGH, GBA

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- ___ 11. Name all segments parallel to \overline{GH} .
- a. $\overline{BG}, \overline{CH}, \overline{FG}, \overline{HI}$ b. $\overline{CD}, \overline{BA}, \overline{AF}, \overline{DI}$
 c. $\overline{CD}, \overline{AB}, \overline{HI}$ d. $\overline{BC}, \overline{AD}, \overline{FI}$

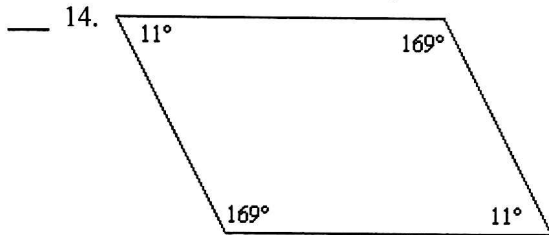
- ___ 12. Name all segments skew to \overline{HI} .
- a. $\overline{BC}, \overline{AD}, \overline{AF}, \overline{BG}$ b. $\overline{FI}, \overline{GH}, \overline{DI}, \overline{CH}$
 c. $\overline{AD}, \overline{AB}, \overline{BC}, \overline{CD}$ d. $\overline{BA}, \overline{BG}, \overline{AF}, \overline{FG}$

___ 13.



- a. $\triangle GHF \cong \triangle KJI$ b. $\triangle FGH \cong \triangle KJI$
 c. $\triangle HFG \cong \triangle KIJ$ d. $\triangle GFH \cong \triangle KIJ$

Determine whether the quadrilateral is a parallelogram. Justify your answer.



- a. Yes; Consecutive angles are not congruent.
 b. No; Consecutive angles are not congruent.
 c. Yes; Opposite angles are congruent.
 d. No; Opposite angles are congruent.

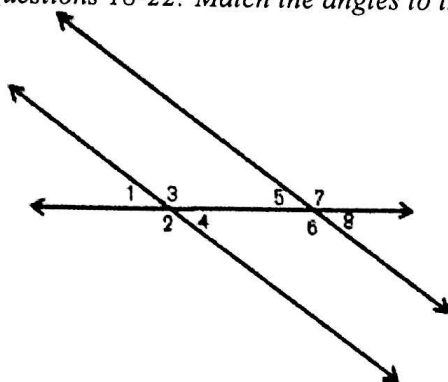
Questions 15-17: Given the statement "If an integer is greater than 10, then it is a positive integer," match the term to the corresponding sentence.

- a. contrapositive b. converse
 c. inverse

- ___ 15. If an integer is not a positive integer, then it is not greater than 10.
 ___ 16. If an integer is not greater than 10, then it is not a positive number.
 ___ 17. If an integer is positive, then it is greater than 10.

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Questions 18-22: Match the angles to the appropriate description.



- a. alternate exterior angles
- b. alternate interior angles
- c. consecutive interior angles
- d. corresponding angles
- e. vertical angles

- ___ 18. $\angle 3$ & $\angle 6$
- ___ 19. $\angle 1$ & $\angle 5$
- ___ 20. $\angle 6$ & $\angle 7$
- ___ 21. $\angle 4$ & $\angle 6$
- ___ 22. $\angle 2$ & $\angle 7$

Questions 23-27: Match the term to the appropriate definition.

- a. equilateral triangle
- b. obtuse triangle
- c. acute triangle
- d. scalene triangle
- e. equiangular triangle

- ___ 23. A triangle for which all interior angles measure less than 90° .
- ___ 24. A triangle for which all three sides have different lengths.
- ___ 25. A triangle which has an angle measuring greater than 90° .
- ___ 26. A triangle with three congruent angles.
- ___ 27. A triangle with three congruent sides.

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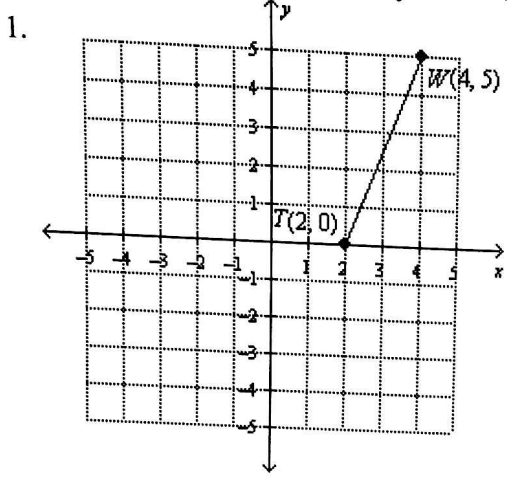
Questions 28-31: Match the term to the appropriate definition.

- a. orthocenter b. centroid
c. incenter d. circumcenter

- ___ 28. point of concurrency of the three perpendicular bisectors of a triangle
___ 29. point of concurrency of the three altitudes of a triangle
___ 30. point of concurrency of the three medians of a triangle
___ 31. point of concurrency of the three angle bisectors of a triangle

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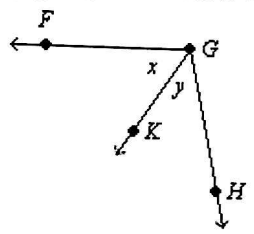
Use the Distance Formula to find the distance between each pair of points.



Find the coordinates of the midpoint of a segment having the given endpoints.

2. $Q(4.4, 8.4), R(8.7, 9.8)$

In the figure, \overrightarrow{GK} bisects $\angle FGH$.



3. If $m\angle FGK = 5w + 7$ and $m\angle FGH = 114$, find w .
4. Two angles are supplementary. One angle measures 26° more than the other. Find the measure of the two angles.
5. The measures of two complementary angles are $6y + 3$ and $4y - 13$. Find the measures of the angles.

Use this statement, "All quadrilaterals are four-sided figures."

6. Write the inverse and converse of this statement. Then, state whether the contrapositive is true or false.
- a. INVERSE:
- b. CONVERSE:
- c. CONTRAPOSITIVE: TRUE or FALSE (circle one)

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Use the following statements to write a compound statement for the conjunction or disjunction. Then use a truth table to find its truth value.

p : An isosceles triangle has two congruent sides.

q : A right angle measures 90°

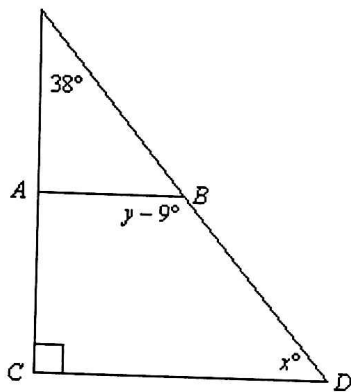
r : Four points are always coplanar.

s : A decagon has 12 sides.

7. $p \vee q$

8. $r \wedge (q \vee s)$

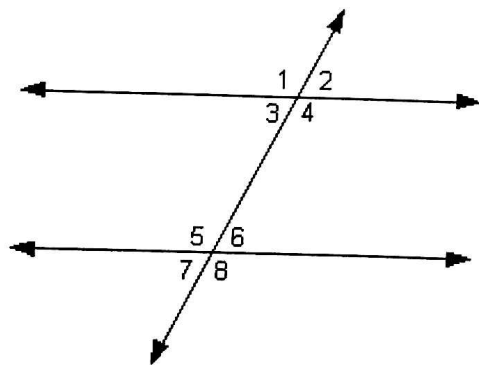
9. In the figure, $\overline{AB} \parallel \overline{CD}$. Find x and y .



Write an equation in slope-intercept form for the line passing through the pair of points.

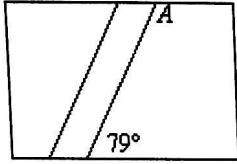
10. $(-4, -2), (2, 1)$

11. In the figure, $\angle 1 = 120$ and line m is parallel to line n . Find the measure of angle 7.



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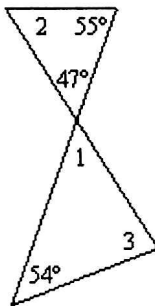
12. A pathway divides a rectangular garden into two parts as shown. Find the measure of $\angle A$.



13. Find the measure of the sides of $\triangle ABC$ with vertices at $A(1, 4)$, $B(-4, 0)$, and $C(3, -6)$. Classify the triangle by its sides.

Find each measure.

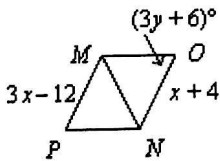
14. $m\angle 1$, $m\angle 2$, $m\angle 3$



Name three pairs of congruent angles and three pairs of congruent sides for the pair of congruent triangles.

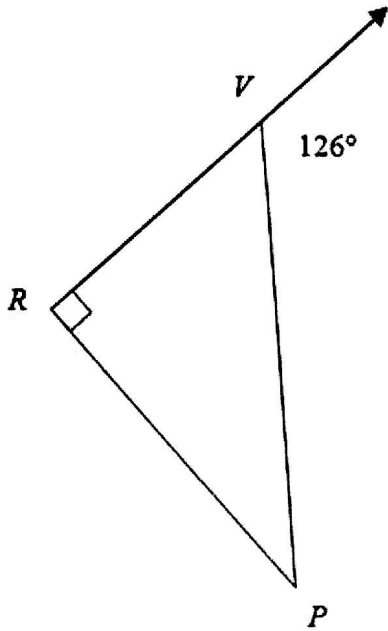
15. $\triangle GHK \cong \triangle XZT$

16. Triangles MNP and OMN are congruent equilateral triangles. Find x and y .



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17. Use the figure below to find $m\angle P$.

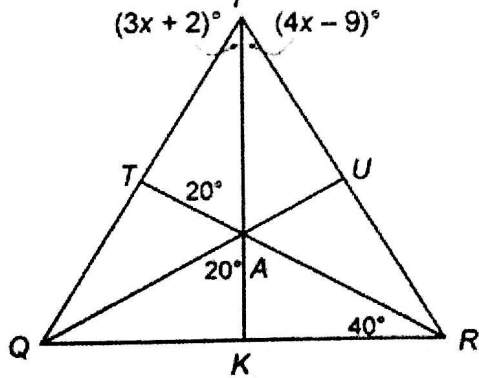


18. Given the congruent triangles described below, find x and y . You may find it helpful to draw a diagram.

$$\triangle JKL \cong \triangle STU, m\angle S = 40^\circ, m\angle J = (8x - 2y)^\circ, m\angle L = 32^\circ, m\angle T = (8x + 15y)^\circ$$

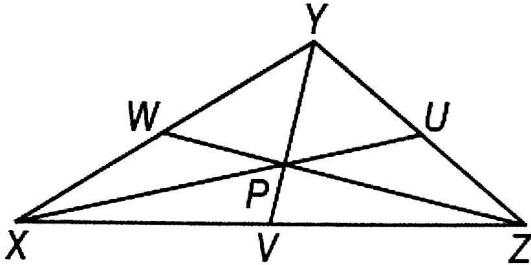
19.

Point A is the incenter of $\triangle PQR$. Find the measure of $m\angle ARU$, $\angle AU$, $m\angle QPK$.

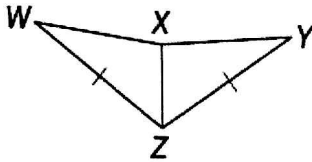


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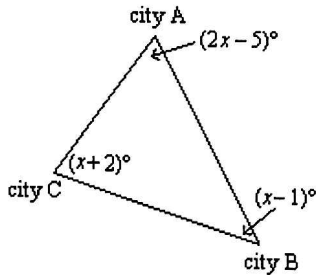
20. P is the centroid of $\triangle XYZ$. If $XU = 18$, what is XP ?



21. In the figure below, $m\angle WZX = 51^\circ$ and $m\angle YZX = 54^\circ$. Compare WX and YX .



22. A salesperson travels from city A to city B and then to city C. From city C, the salesperson travels directly back to city A as shown in the diagram below. Write the lengths of the legs of the trip in order from least to greatest.



Determine whether a figure with the given vertices can be parallelogram ABCD. Use the method indicated.

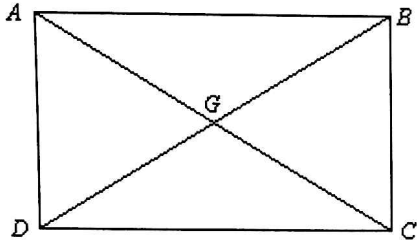
23. $A(-6, -2), B(-8, 7), C(10, 9), D(-9, 1)$; Slope Formula

24. $A(-3, -5), B(2, -2), C(1, 2), D(-4, -1)$; Midpoint Formula

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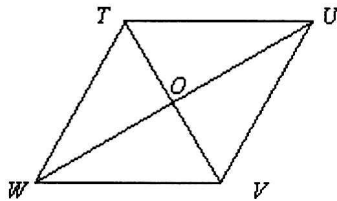
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Quadrilateral ABCD is a rectangle.



25. If $AG = -7j + 7$ and $DG = 5j + 43$, find BD .

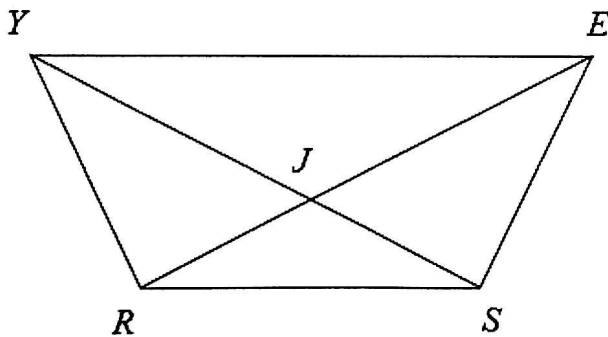
26. In rhombus $TUVW$, if $TU = 19$, find VW .



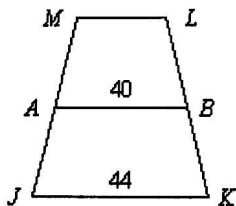
Given each set of vertices, determine whether parallelogram ABCD is a rhombus, a rectangle, or a square. List all that apply.

27. $A(-11, 3), B(-9, 3), C(-9, 5), D(-11, 5)$

28. Trapezoid $YESR$ is an isosceles trapezoid. If $m\angle YES = 78^\circ$, what is $m\angle ESR$?



29. For trapezoid $JKLM$, A and B are midpoints of the legs. Find ML .



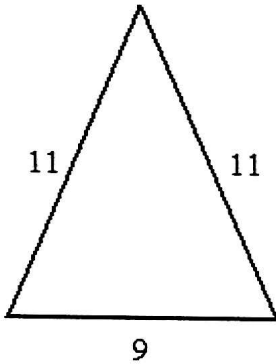
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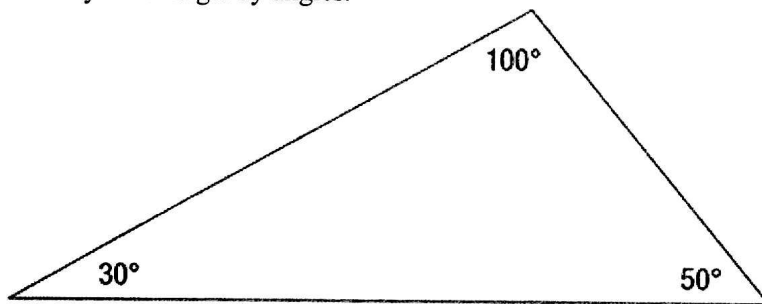
30. The face of Jesse's wristwatch is a regular hexagon. Find the measure of an interior angle and an exterior angle of the face.
31. Richard wants to buy a LCD flat panel monitor measuring 14 inches by 16 inches. What is the measure of the diagonal of the monitor?

Classify the triangle by its sides.

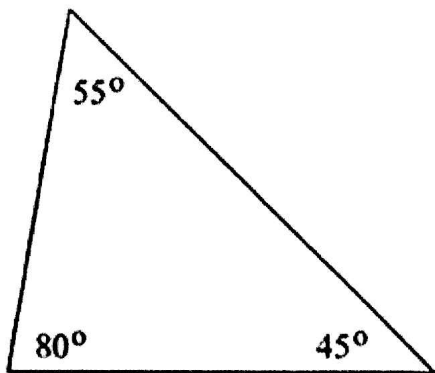
32.



33. Classify the triangle by angles.



34. Classify the triangle by angles.



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35. Choose one (1) of the two and write an indirect proof.

a. **Given:** $2x+12=8$, **Prove:** $x=-2$ OR

b. **Given:** $\triangle RST$; $m\angle RST > 90$, **Prove:** $m\angle RST > m\angle SRT$

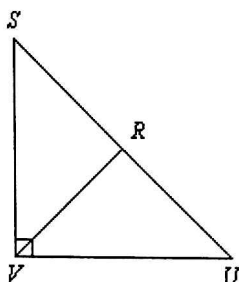
36. List 5 ways to prove that a quadrilateral can be called a parallelogram.

- a) _____
- b) _____
- c) _____
- d) _____
- e) _____

37. Fill in the missing reasons in the two-column proof shown below.

Given: R is the midpoint of \overline{SU} ; $\overline{SV} \cong \overline{UV}$.

Prove: $\triangle RSV \cong \triangle RUV$



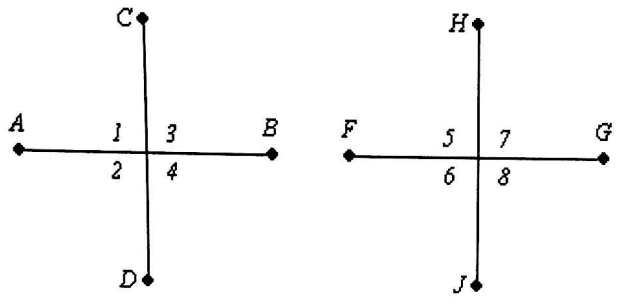
Statements	Reasons
1. R is the midpoint of \overline{SU} .	1.
2. $\overline{RS} \cong \overline{RU}$	2.
3. $\overline{SV} \cong \overline{UV}$	3.
4. $\overline{RV} \cong \overline{RV}$	4.
5. $\triangle RSV \cong \triangle RUV$	5.

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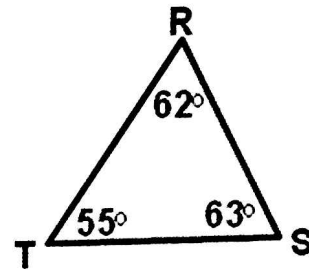
38. Given: $\overline{AB} \perp \overline{CD}$, $\overline{FG} \perp \overline{HJ}$.

Prove: $\angle 2 \cong \angle 7$

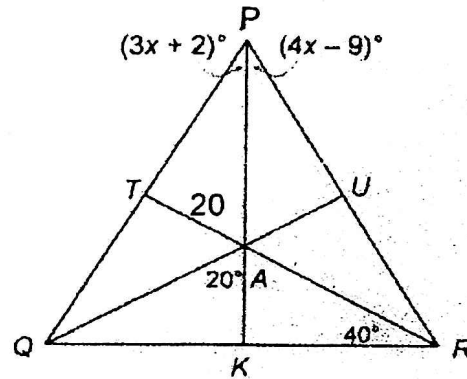


Practice Exam Winter 2013 – Part 3

1. Determine the relationship between the lengths of the given sides.
 - a. RS, ST
 - b. RT, ST



2. Point A is the incenter of $\triangle PQR$. Find $m\angle ARU, m\angle QPK, AU$



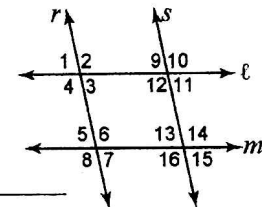
- 3.

Complete the proof.

Given: $\angle 1 \cong \angle 5, \angle 15 \cong \angle 5$

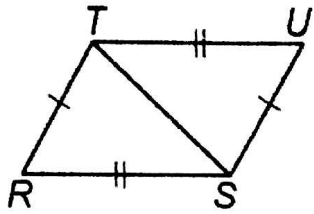
Prove: $\ell \parallel m, r \parallel s$

Proof:



Statements	Reasons
1. $\angle 15 \cong \angle 5$	1. _____
2. $\angle 13 \cong \angle 15$	2. _____
3. $\angle 5 \cong \angle 13$	3. _____
4. $r \parallel s$	4. _____
5. _____	5. Given
6. _____	6. If corr \sphericalangle are \cong , then lines \parallel .

4. Write a two-column proof.



Given: $\overline{RS} \cong \overline{UT}, \overline{RT} \cong \overline{US}$

Prove: $\triangle RST \cong \triangle UTS$

STATEMENTS

REASONS

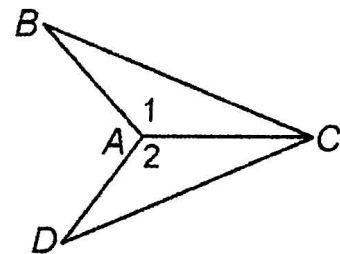
5.

PROOF Write a two-column proof.

Given: $\overline{BA} \cong \overline{DA}$

$BC > DC$

Prove: $m\angle 1 > m\angle 2$



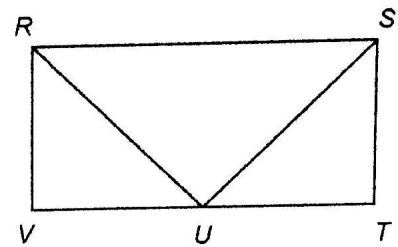
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6. **PROOF:** Write a two-column proof.

Given: $RSTV$ is a rectangle and U is the midpoint of VT .

Prove: $\triangle RUV \cong \triangle SUT$



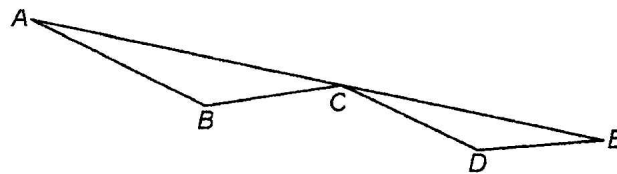
Statements	Reasons

BONUS:

Proof Complete the proof.

Given: $\triangle ABC$ and $\triangle CDE$

Prove: $AB + BC + CD + DE > AE$



Proof:

Statements	Reasons
1. $AB + BC > AC$ $CD + DE > CE$	1. _____
2. $AB + BC + CD + DE > AC + CE$	2. _____
3. _____	3. Seg. Addition Post
4. _____	4. Substitution