

Geometry Extra Credit Project
Fall Final Exam Study Booklet Rubric

Points Earned	2 Exemplary	1.5 Proficient	1 Below Average	.5 Unacceptable
Cover	Very Creative!! Colorful and Neat	Creative! Colorful and Neat	Colorful.	Not complete or not complete on HS level
Unit 1 Vocab Concepts	Well written!! Neat, proper, and well informed.	Average Couple mistakes Semi-informed	Below Average Several mistakes Not well informed	Incomplete and/or little to no effort
Review Problems	All Problems completed with all work shown and correct.	All Problems completed with all work shown with some mistakes.	Most problems completed but with some work missing and some mistakes.	Little or no problems worked with little or no work shown.
Unit 2 Vocab Concepts	Well written!! Neat, proper, and well informed.	Average Couple mistakes Semi-informed	Below Average Several mistakes Not well informed	Incomplete and/or little to no effort
Review Problems	All Problems completed with all work shown and correct.	All Problems completed with all work shown with some mistakes.	Most problems completed but with some work missing and some mistakes	Little or no problems worked with little or no work shown.
Unit 3 Vocab Concepts	Well written!! Neat, proper, and well informed.	Average Couple mistakes Semi-informed	Below Average Several mistakes Not well informed	Incomplete and/or little to no effort
Review Problems	All Problems completed with all work shown and correct.	All Problems completed with all work shown with some mistakes.	Most problems completed but with some work missing and some mistakes	Little or no problems worked with little or no work shown.
Unit 4 Vocab Concepts	Well written!! Neat, proper, and well informed.	Average Couple mistakes Semi-informed	Below Average Several mistakes Not well informed	Incomplete and/or little to no effort
Review Problems	All Problems completed with all work shown and correct.	All Problems completed with all work shown with some mistakes.	Most problems completed but with some work missing and some mistakes	Little or no problems worked with little or no work shown.
Unit 5 Vocab Concepts	Well written!! Neat, proper, and well informed.	Average Couple mistakes Semi-informed	Below Average Several mistakes Not well informed	Incomplete and/or little to no effort
Review Problems	All Problems completed with all work shown and correct.	All Problems completed with all work shown with some mistakes.	Most problems completed but with some work missing and some mistakes	Little or no problems worked with little or no work shown.
Unit 6 Vocab Concepts	Well written!! Neat, proper, and well informed.	Average Couple mistakes Semi-informed	Below Average Several mistakes Not well informed	Incomplete and/or little to no effort
Review Problems	All Problems completed with all work shown and correct.	All Problems completed with all work shown with some mistakes.	Most problems completed but with some work missing and some mistakes	Little or no problems worked with little or no work shown.

Unit 7 Vocab Concepts	Well written!! Neat, proper, and well informed.	Average Couple mistakes Semi-informed	Below Average Several mistakes Not well informed	Incomplete and/or little to no effort
Review Problems	All Problems completed with all work shown and correct.	All Problems completed with all work shown with some mistakes.	Most problems completed but with some work missing and some mistakes	Little or no problems worked with little or no work shown.
Unit 8 Vocab Concepts	Well written!! Neat, proper, and well informed.	Average Couple mistakes Semi-informed	Below Average Several mistakes Not well informed	Incomplete and/or little to no effort
Review Problems	All Problems completed with all work shown and correct.	All Problems completed with all work shown with some mistakes.	Most problems completed but with some work missing and some mistakes	Little or no problems worked with little or no work shown.
Unit 9 Vocab Concepts	Well written!! Neat, proper, and well informed.	Average Couple mistakes Semi-informed	Below Average Several mistakes Not well informed	Incomplete and/or little to no effort
Review Problems	All Problems completed with all work shown and correct.	All Problems completed with all work shown with some mistakes.	Most problems completed but with some work missing and some mistakes	Little or no problems worked with little or no work shown.
<u>Total Points Earned</u>				
Packet assembly: Cover, Unit 1, Unit 2, Unit 3, Unit 4, Unit 5, Unit 6, Unit 7, Unit 8, Unit 9			+ 2 points if packet was in order.	+ 0 points if packet was not in order.
Thank you for your participation in Geometry's Extra Credit Project Study Booklet. The final grade is determined by the points earned out of 60 possible points.				

Comments:

Questions:

What did you learn from doing this project?

Would you want to do this project next semester?

What would you change regarding your performance in Geometry this semester?

Geometry Extra Credit Project

Study Booklet

Due Monday December 5th

Objective: Students will use directions provided below to create a study booklet to help them review for the Fall Semester Final Exam while earning extra credit in the course.

Part 1

Directions: You are going to make a study guide booklet for the upcoming final exam. You will include relevant definitions and examples from each of the units covered. You can decorate the cover using your own creativity as long as it indicates that the booklet is a "Study Guide for Geometry Fall Final Exam". Each section of the study booklet will include the important concepts and vocabulary detailed as follows:

Unit 1: Geometry Basics	Unit 2: Logic and Proofs	Unit 3: Transformations	Unit 4: Triangle Basics	Unit 5: Points of Concurrency	Unit 6: Parallel Lines and Transversals	Unit 7: Similarity	Unit 8: Congruency	Unit 9: Special Right Triangles
<ul style="list-style-type: none"> Points, Lines, and Planes Vocabulary Distance and Midpoint Formula Adjacent, vertical, complementary, supplementary, and linear pair vocabulary 	<ul style="list-style-type: none"> Vocabulary 	<ul style="list-style-type: none"> Vocabulary Formulas Rigid vs. Non-Rigid Direct vs. Opposite Orientation 	<ul style="list-style-type: none"> Classifying Triangles by Sides and Angles Triangle Angle Sum Theorem Exterior Angle Theorem 	<ul style="list-style-type: none"> Basic Vocabulary What special segments make each POC Characteristics of each POC 	<ul style="list-style-type: none"> Vocabulary 	<ul style="list-style-type: none"> Properties of Similar Figures What theorems prove two triangles are similar? 	<ul style="list-style-type: none"> Properties of Congruent Figures What theorems prove two triangles are congruent? 	<ul style="list-style-type: none"> Pythagorean Theorem Hinge Theorem 45-45-90 30-60-90

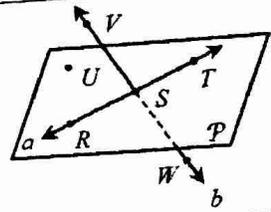
Part 2

In addition to the study booklet, you must also complete the study guide packet. All work must be shown! No work, no credit! Your work as needs to be neat and easy to read.

Unit 1 Review Problems

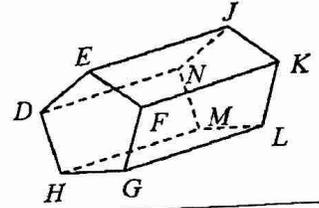
1. Use the diagram to the right to answer the questions below.

- a. Name a point collinear to points S and T . _____
- b. Give another name for line b . _____
- c. Name a point non-coplanar to points R , T , and U . _____



2. Use the diagram to the right to answer the questions below.

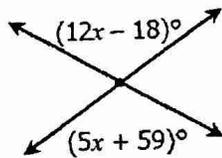
- a. Name the intersection of planes JKL and HGL . _____
- b. Name a point coplanar to points F , K , and J . _____
- c. Are points E , J , and G coplanar? Explain. _____



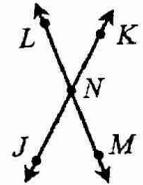
5. A segment has a midpoint at $(2, -7)$ and an endpoint at $(8, -5)$. What are the coordinates of the other endpoint?

6. If X is the midpoint of \overline{WY} , $WX = 3x - 1$ and $WY = 10x - 26$, find XY .

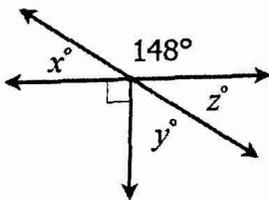
7. Find the value of x .



8. If $m\angle LNK = (5x - 27)^\circ$ and $m\angle KNM = (10x - 3)^\circ$, find $m\angle JNM$.



9. Find each missing measure.

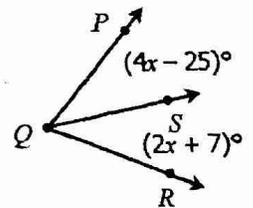


$x =$ _____

$y =$ _____

$z =$ _____

10. If \overline{QS} bisects $\angle PQR$, find $m\angle PQR$.



11. $\angle R$ and $\angle S$ are complementary angles. If $m\angle R = (6x - 47)^\circ$ and $m\angle S = (x + 4)^\circ$, find $m\angle S$.

12. $\angle C$ and $\angle D$ are supplementary angles. If $m\angle D$ is nine less than twice $m\angle C$, find $m\angle D$.

Unit 2 Review Problems

Write the letter of the property, definition, or postulate that justifies each statement.

- _____ 29. If $\angle ABC \cong \angle CBD$, then $\angle CBD \cong \angle ABC$
- _____ 30. If $VW + WY = ZY$, and $VW + WY = XZ$, then $XZ = ZY$
- _____ 31. If S is between R and T , then $RS + ST = RT$
- _____ 32. If $JK + KL = MN + KL$, then $JK = MN$
- _____ 33. If $m\angle A = m\angle C$, and $m\angle C = m\angle D$, then $m\angle A = m\angle D$
- _____ 34. If $PQ = QT$, then $PQ + RS = PQ + RS$
- _____ 35. $m\angle DEF = m\angle DEF$
- _____ 36. If $\frac{1}{2}XZ = XY$, then $XZ = 2XY$
- _____ 37. If $m\angle LMN = m\angle MNP$, then $\angle LMN \cong \angle MNP$

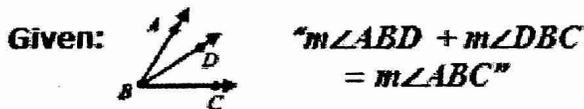
- A. Addition Property of Equality
- B. Subtraction Property of Equality
- C. Multiplication Property of Equality
- D. Division Property of Equality
- E. Substitution Property
- F. Reflexive Property (of = or \cong)
- G. Symmetric Property (of = or \cong)
- H. Transitive Property (of = or \cong)
- I. Definition of Congruence
- J. Definition of Midpoint
- K. Segment Addition Postulate
- L. Angle Addition Postulate

28. Given: D is the midpoint of \overline{CE}
 Prove: $DE = \frac{1}{2}CE$



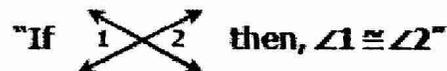
Statements	Reasons
1. D is the midpoint of \overline{CE}	1.
2. $CD = DE$	2.
3. $CD + DE = DE + DE$	3.
4. $CD + DE = 2DE$	4.
5. $CD + DE = CE$	5.
6. $2DE = CE$	6.
7. $DE = \frac{1}{2}CE$	7.

29. Which reason justifies the statement below?



- A. Angle Addition Postulate
- B. Definition of Angle Bisector
- C. Addition Property
- D. Definition of Congruence

30. Which reason justifies the statement below?



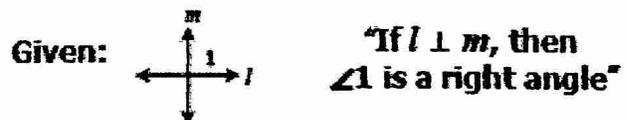
- A. Definition of Congruence
- B. Angle Addition Postulate
- C. Supplement Theorem
- D. Definition of Vertical Angles

31. Which reason justifies the statement below?

"If $\angle A$ and $\angle B$ are complementary, then $m\angle A + m\angle B = 90^\circ$ "

- A. The Complement Theorem
- B. Definition of a Right Angle
- C. Congruent Complements Theorem
- D. Definition of Complementary Angles

32. Which reason justifies the statement below?

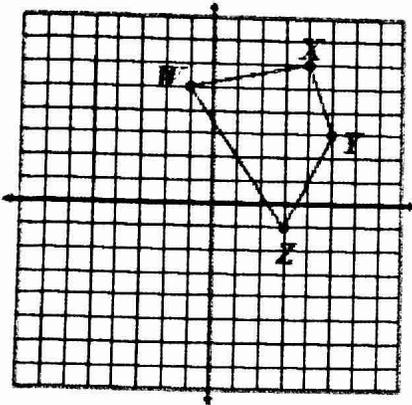


- A. Definition of Complementary Angles
- B. Definition of a Right Angle
- C. Definition of Perpendicular
- D. The Complement Theorem

Unit 3 Review Problems

Complete each transformation as indicated. Give the coordinates of the image.

24. Reflection across $y = -x$



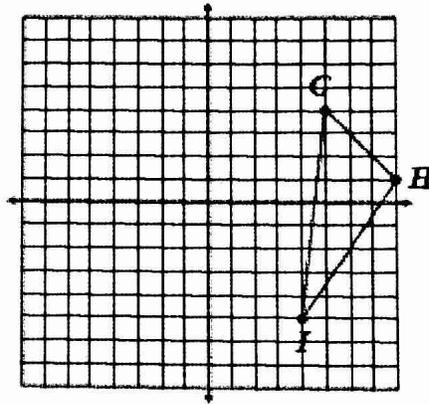
W' ()

X' ()

Y' ()

Z' ()

25. Reflection across $x = 3$

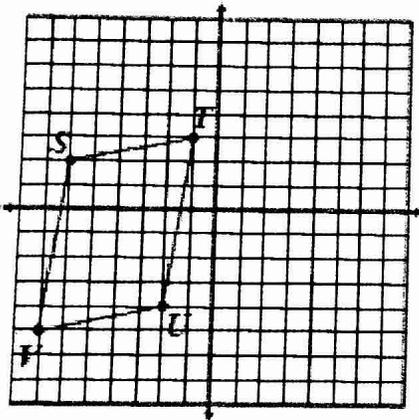


G' ()

H' ()

I' ()

26. $(x, y) \rightarrow (x + 7, y - 3)$



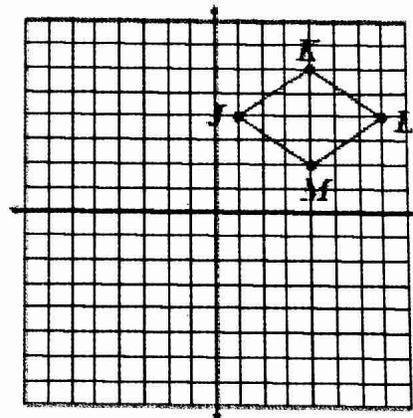
S' ()

T' ()

U' ()

V' ()

27. 90° counterclockwise about origin



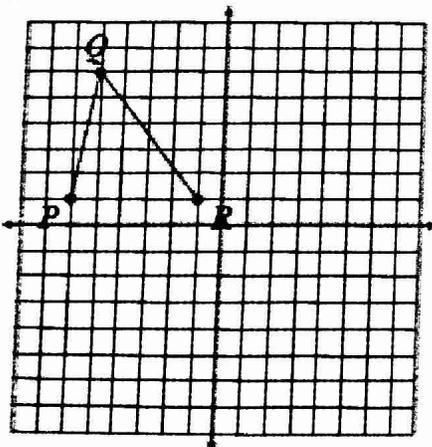
J' ()

K' ()

L' ()

M' ()

28. 180° counterclockwise about origin

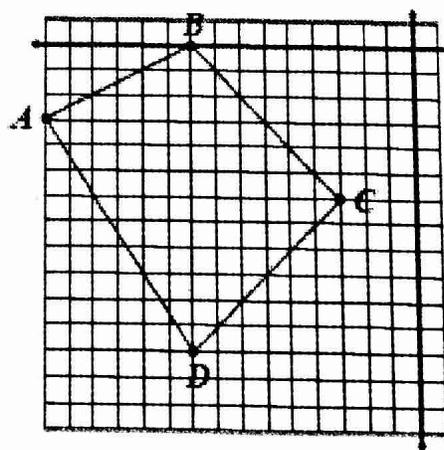


P' ()

Q' ()

R' ()

29. Dilate using a scale factor of $k = 1/3$



A' ()

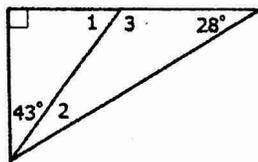
B' ()

C' ()

D' ()

Unit 4 Review Problems

54. Find the measure of each numbered angle.

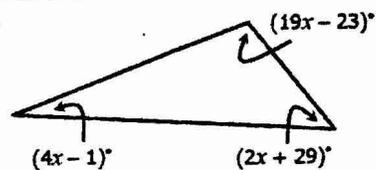


$$m\angle 1 = \underline{\hspace{2cm}}$$

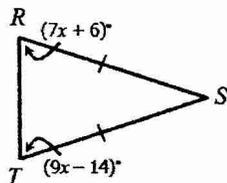
$$m\angle 2 = \underline{\hspace{2cm}}$$

$$m\angle 3 = \underline{\hspace{2cm}}$$

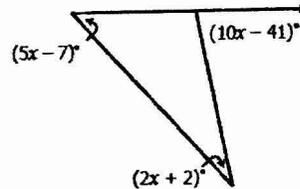
55. Find the value of x .



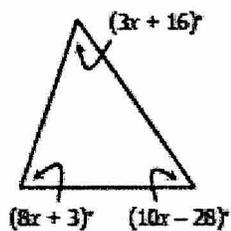
56. Find $m\angle S$.



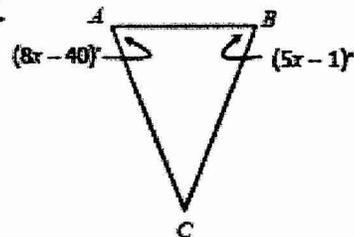
57. Find the value of x .



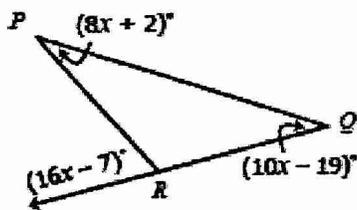
1. Find the value of x .



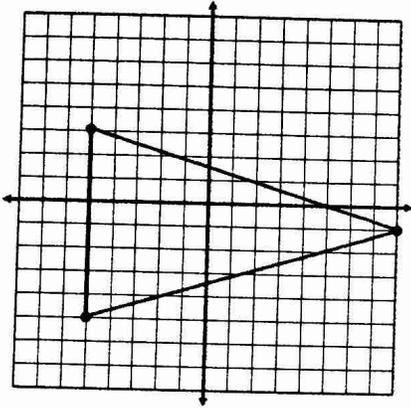
2. If $AC = BC$, find $m\angle C$.



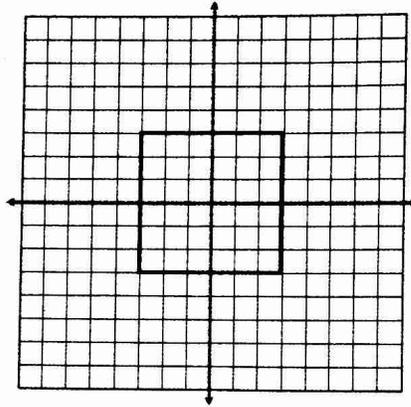
3. Find $m\angle PRQ$.



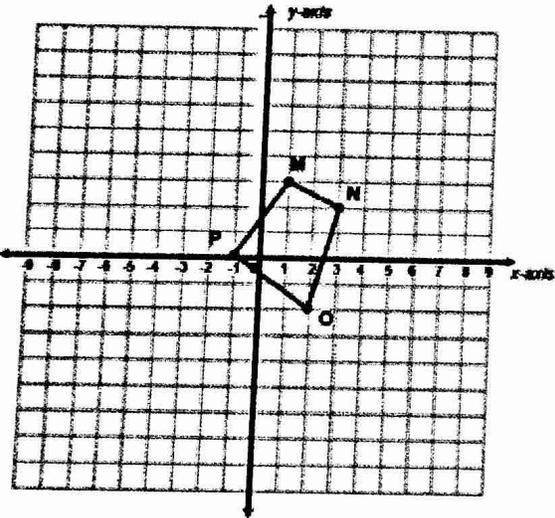
36. List all the lines of symmetry of the triangle below.



37. List all the lines of symmetry of the square below.



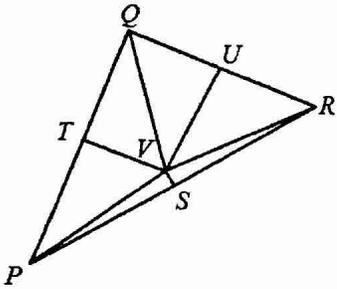
38. Graph the dilated image of quadrilateral MNOP using a scale factor of 3 and (1,1) as the center of dilation.



M: _____	M': _____
N: _____	N': _____
O: _____	O': _____
P: _____	P': _____

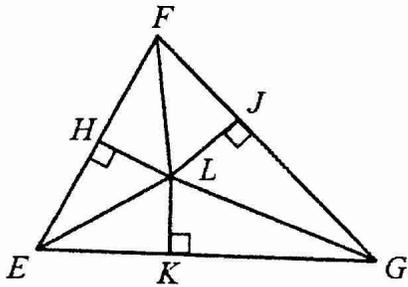
Unit 5 Review Problems

1. If V is the circumcenter of $\triangle PQR$, $PR = 46$, $TV = 15$, and $VR = 25$, find each measure.



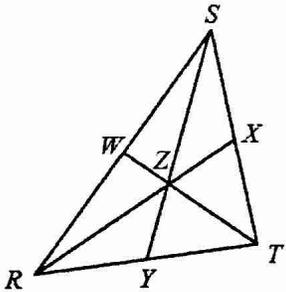
- a) $SR =$ _____
- b) $QV =$ _____
- c) $QT =$ _____
- d) $PQ =$ _____
- e) $VS =$ _____

2. If L is the incenter of $\triangle EFG$, $JL = 16$, $EH = 22$, and $LG = 34$, find each measure.



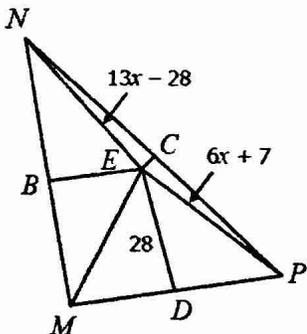
- a) $LH =$ _____
- b) $EL =$ _____
- c) $JG =$ _____
- d) $EK =$ _____
- e) $KG =$ _____

3. If Z is the centroid of $\triangle RST$, $RZ = 42$, $ST = 74$, $TW = 51$, $ZY = 23$ and find each measure.



- a) $XT =$ _____
- b) $TZ =$ _____
- c) $ZW =$ _____
- d) $XZ =$ _____
- e) $SY =$ _____

4. If E is the circumcenter of $\triangle MNP$, find each measure.

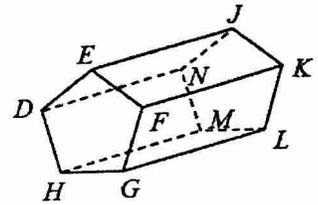


- a) $x =$ _____
- b) $NE =$ _____
- c) $MD =$ _____

Unit 6 Review Problems

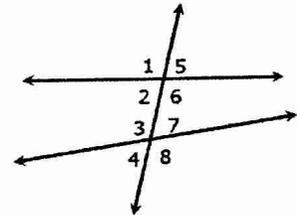
38. Use the diagram to the right to answer the questions below.

- a. Name a plane parallel to plane $DEFGH$ _____
- b. Name two segments parallel to \overline{GL} _____
- c. Name a segment parallel to \overline{MN} _____
- d. Name a segment skew to \overline{EJ} _____



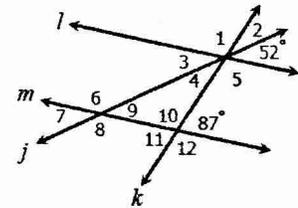
39. Use the diagram to the right to classify each pair of angles.

- a. $\angle 1$ and $\angle 8$ _____
- b. $\angle 6$ and $\angle 7$ _____
- c. $\angle 2$ and $\angle 4$ _____
- d. $\angle 3$ and $\angle 6$ _____

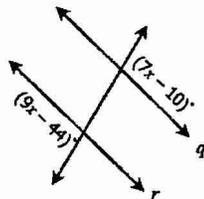


40. If $l \parallel m$, find the measure of each missing angle.

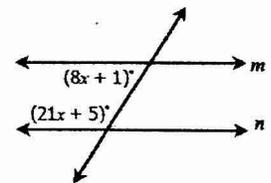
a. $m\angle 1 =$	e. $m\angle 5 =$	i. $m\angle 9 =$
b. $m\angle 2 =$	f. $m\angle 6 =$	j. $m\angle 10 =$
c. $m\angle 3 =$	g. $m\angle 7 =$	k. $m\angle 11 =$
d. $m\angle 4 =$	h. $m\angle 8 =$	l. $m\angle 12 =$



41. If $q \parallel r$, solve for x .

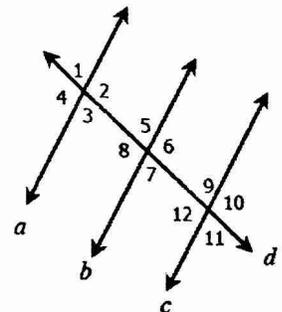


42. If $m \parallel n$, solve for x .



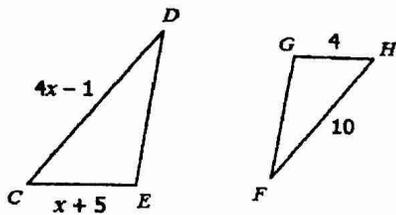
43. Use the diagram to the right to answer the questions below.

- a. If $m\angle 1 = 84^\circ$, what must be $m\angle 5$ in order for $a \parallel b$? _____
- b. If $m\angle 2 = 109^\circ$, what must be $m\angle 9$ in order for $a \parallel c$? _____
- c. If $m\angle 5 = 68^\circ$, what must be $m\angle 11$ in order for $b \parallel c$? _____
- d. If $m\angle 3 = m\angle 9$, what converse proves $a \parallel c$? _____
- e. If $m\angle 8 = m\angle 12$, what converse proves $b \parallel c$? _____
- f. If $m\angle 2 + m\angle 5 = 180^\circ$, what converse proves $a \parallel b$? _____

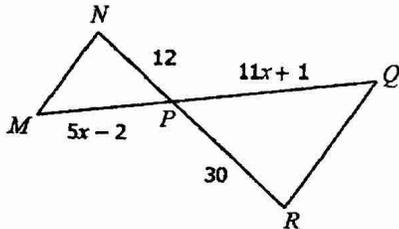


Unit 7 Review Problems

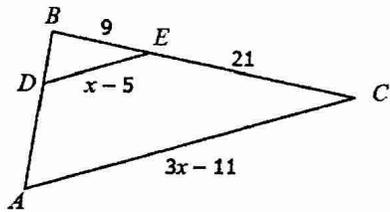
71. If $\triangle CDE \sim \triangle HFG$, find CD .



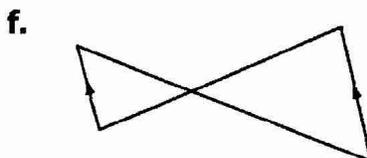
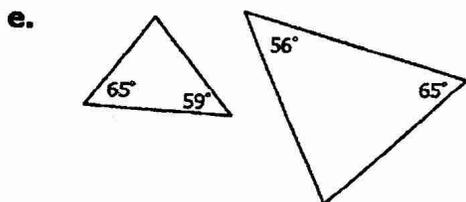
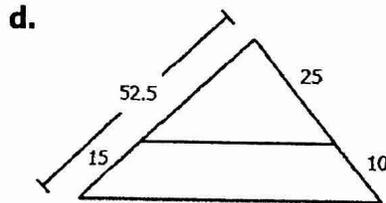
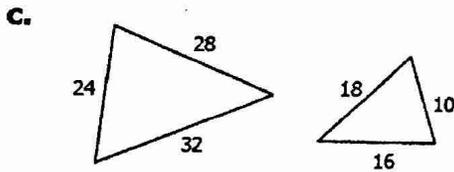
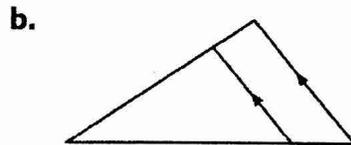
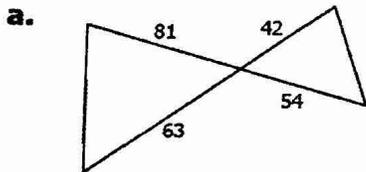
72. If $\triangle MNP \sim \triangle QRP$, find MP .



72. If $\triangle ABC \sim \triangle DBE$, find the value of x .

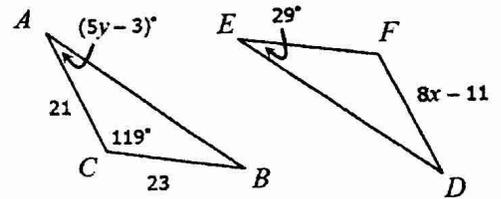


75. Determine if the triangles below are similar. If yes, state which method.



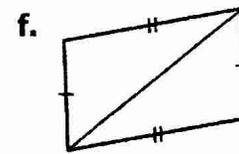
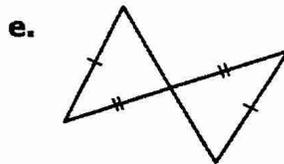
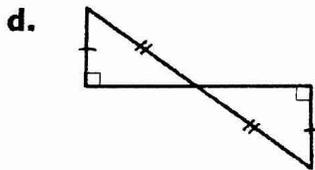
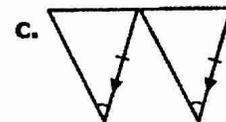
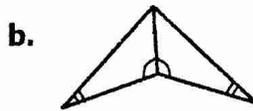
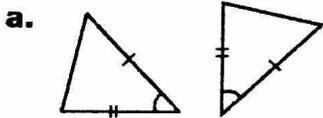
Unit 8 Review Problems

58. If $\triangle ABC \cong \triangle DEF$, solve for x and y .



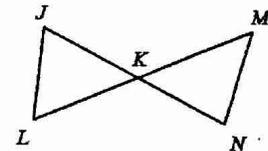
59. What are the methods to prove triangles are congruent?

60. Determine if the triangles below are congruent. If yes, state which method.



Complete the proofs using the most appropriate method.

61. **Given:** K is the midpoint of \overline{JN} and \overline{LM}
Prove: $\triangle JKL \cong \triangle NKM$



Statements	Reasons
1. K is the midpoint of \overline{JN} and \overline{LM}	1.
2. $\overline{JK} \cong \overline{KN}$; $\overline{LK} \cong \overline{KM}$	2.
3. $\angle JKL \cong \angle MKN$	3.
4. $\triangle JKL \cong \triangle NKM$	4.

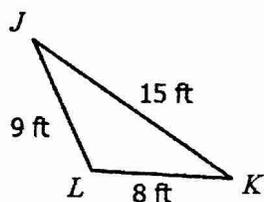
Unit 9 Review Problems

65. Which of the following could represent the side lengths of a triangle? Check all that apply.

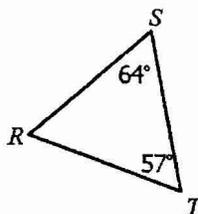
- 6, 10, 14
- 12, 15, 29
- 8, 8, 11
- 19, 24, 40
- 9, 17, 26

66. Two sides of a triangle measure 11 meters and 24 meters. Write an inequality to show the range of possible lengths for the third side.

67. Order the angles of $\triangle JKL$ from least to greatest.



68. Order the sides of $\triangle RST$ from greatest to least.

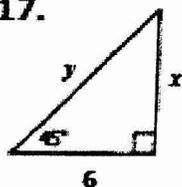


69. List the sides of $\triangle FGH$ in order from least to greatest if $m\angle F = 4x + 7$, $m\angle G = 5x - 31$, and $m\angle H = 7x - 52$.

70. If $\triangle MNP$, $MN = 4x + 1$, $NP = 7x - 11$, and $MP = 11x - 16$. If the perimeter of $\triangle MNP$ is 84, order the angles from greatest to least.

Find each missing value.

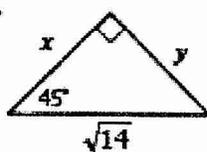
17.



$x =$ _____

$y =$ _____

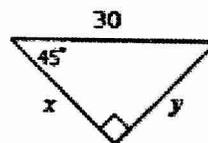
18.



$x =$ _____

$y =$ _____

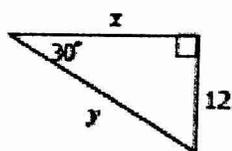
19.



$x =$ _____

$y =$ _____

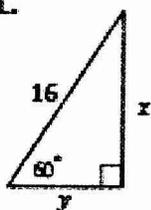
20.



$x =$ _____

$y =$ _____

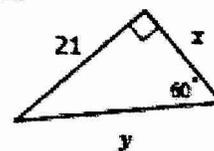
21.



$x =$ _____

$y =$ _____

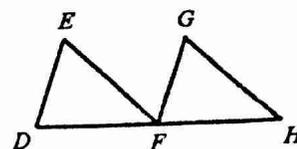
22.



$x =$ _____

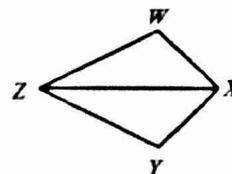
$y =$ _____

62. Given: $\overline{DE} \parallel \overline{GF}$, $\overline{EF} \parallel \overline{GH}$, $\overline{DF} \cong \overline{FH}$
 Prove: $\triangle DEF \cong \triangle FGH$



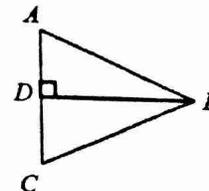
Statements	Reasons
1. $\overline{DE} \parallel \overline{GF}$, $\overline{EF} \parallel \overline{GH}$	1.
2. $\angle EDF \cong \angle GFH$; $\angle EFD \cong \angle GHF$	2.
3. $\overline{DF} \cong \overline{FH}$	3.
4. $\triangle DEF \cong \triangle FGH$	4.

63. Given: \overline{ZX} bisects $\angle WXY$, $\angle ZWX \cong \angle ZYX$
 Prove: $\triangle ZWX \cong \triangle ZYX$



Statements	Reasons
1. \overline{ZX} bisects $\angle WXY$	1.
2. $\angle WXZ \cong \angle YXZ$	2.
3. $\angle ZWX \cong \angle ZYX$	3.
4. $\overline{ZX} \cong \overline{ZX}$	4.
5. $\triangle ZWX \cong \triangle ZYX$	5.

64. Given: $\triangle ADB$ and $\triangle CDB$ are right triangles, $\overline{AB} \cong \overline{BC}$
 Prove: $\triangle ADB \cong \triangle CDB$

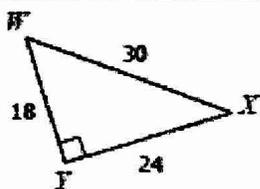


Statements	Reasons
1. $\triangle ADB$ and $\triangle CDB$ are right triangles	1.
2. $\overline{AB} \cong \overline{BC}$	2.
3. $\overline{DB} \cong \overline{DB}$	3.
4. $\triangle ADB \cong \triangle CDB$	4.

Unit 9 Review Problems

Find the value of each trigonometric ratio. Give your answer as a fraction in simplest form.

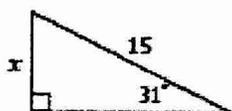
23.



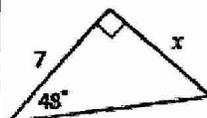
- $\sin W = \underline{\hspace{2cm}}$
- $\cos W = \underline{\hspace{2cm}}$
- $\tan W = \underline{\hspace{2cm}}$
- $\sin X = \underline{\hspace{2cm}}$
- $\cos X = \underline{\hspace{2cm}}$
- $\tan X = \underline{\hspace{2cm}}$

Solve for x . Round your answer to the nearest tenth.

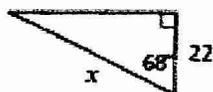
24.



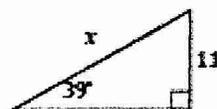
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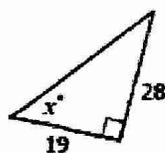
26.



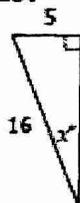
27.



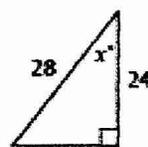
28.



29.



30.



31. The angle of elevation from a buoy in the water to the top of a lighthouse is 68° . If the buoy is 300 feet from the base of the lighthouse, find the height of the lighthouse.

32. A wire is tied from the top of one tower to the top of another. The angle of depression from the top of the taller tower to the top of the shorter tower is 37° . If the wire is 100 feet long, find the distance between the towers.