

Name _____

Finals Review Packet

You will complete the following problems in this packet. We will have time to work on them in class, and you will continue working on it at home.

Answers (not solutions) are posted on the classroom website – CHECK THEM!

This packet is worth 10 points.

It is due on the day of your final exam (Jan. 18 for per. 1 & 2...Jan 19 for per. 3...Jan 20 for per. 5 & 6)

CHAPTER 1

1. Draw and label a diagram for each figure.

a. Point W

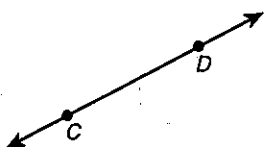
b. line MN

c. $\overleftrightarrow{JK}$

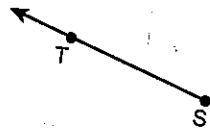
d. $\overrightarrow{EF}$

2. Name each figure using symbols and words.

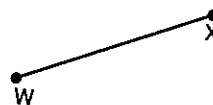
a.



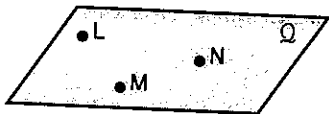
b.



c.



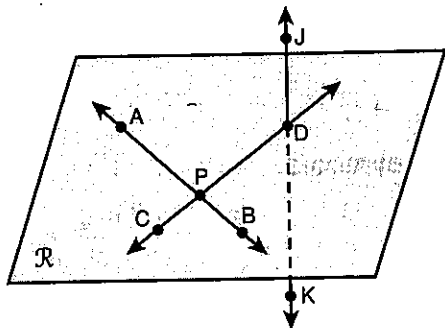
3. Name the plane in two different ways.



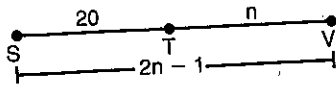
4. Name the following from the figure below:

a. three collinear points

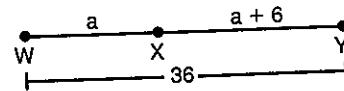
b. three noncollinear points



5. Find SV .



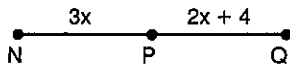
6. Find XY .



7. Use a compass to construct $\overline{ST}$ so that it is congruent to $\overline{JK}$.



8. The **midpoint** of a segment separates the segment into two congruent segments. In the figure, P is the midpoint of $\overline{NQ}$.

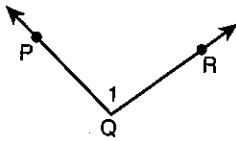


a. $\overline{PQ}$ is congruent to _____

b. What is the value of x ? _____

c. Find NP, PQ, and NQ.

9. Name the angle in three ways.

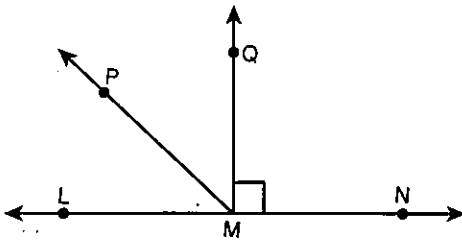


10. Classify each angle as acute, right, obtuse, or straight.

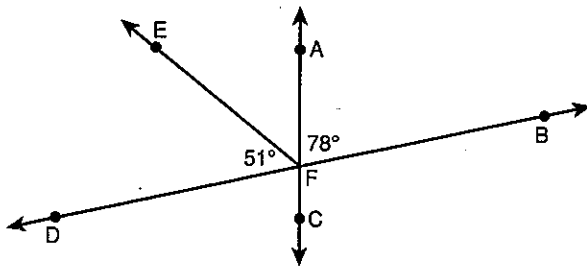
a. $\angle NMP$

b. $\angle QMN$

c. $\angle PMQ$



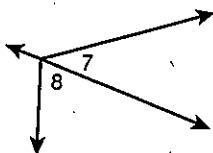
11. Use the diagram below to find each angle measure.



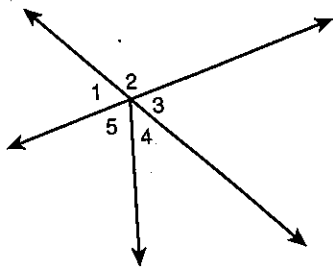
a. Find $m\angle EFA$ if the angle is congruent to $\angle DFE$.

b. Find $m\angle CFG$ if $\overrightarrow{FG}$ is an angle bisector of $\angle CFB$.

12. Tell whether $\angle 7$ and $\angle 8$ in the figure are only adjacent, are adjacent and form a linear pair, or are not adjacent.

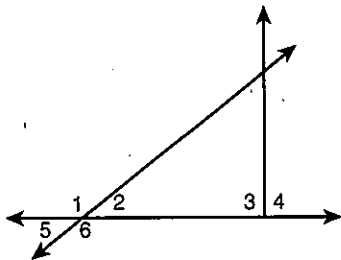


13. Use the diagram below to tell whether the indicated angles are only adjacent, are adjacent and form a linear pair, or are not adjacent.



- a. $\angle 5$ and $\angle 4$
- b. $\angle 1$ and $\angle 4$
- c. $\angle 2$ and $\angle 3$

14. Use the diagram below to name each of the following:



- a. A pair of vertical angles
- b. A linear pair
- c. An angle adjacent to $\angle 4$

15. If $m\angle R = 22^\circ$, find...

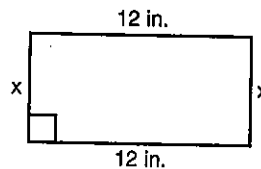
- a. The complement of $\angle R$
- b. the supplement of $\angle R$

16. $\angle LMN$ and $\angle UVW$ are complementary. Find the measure of each angle if $m\angle LMN = (3x + 5)^\circ$ and $m\angle UVW = 2x^\circ$.

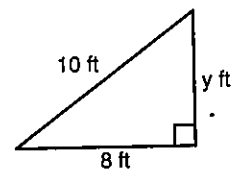
17. Find the perimeter and area of each figure.

- a. Square with a side length of 8mm

b.



c.



18. Find the midpoint of $\overline{QR}$, whose endpoints are $Q(0, 5)$ and $R(6, 7)$.

19. $M(-3, 2)$ is the midpoint of $\overline{RS}$, and R has coordinates $(6, 0)$. What are the coordinates of S ?

20. $M(7, 1)$ is the midpoint of $\overline{WX}$, and X has coordinates $(-1, 5)$. What are the coordinates of W ?
21. Use the distance formula to find the length of $\overline{QR}$ with endpoints $Q(2, 4)$ and $R(-3, 9)$. Leave answer EXACT units.
22. Use the Pythagorean Theorem to find the length of $\overline{LM}$ with endpoints $L(-2, 4)$ and $M(3, -4)$. Leave answer in EXACT units.

CHAPTER 2

23. Find the next item in the pattern: 100, 81, 64, 49, _____
24. Complete the conjecture: If the side length of a square is doubled, the perimeter of the square is _____.
25. Show that the conjecture is false by providing a counterexample:
"If two angles are acute, then the sum of their measures equals the measure of an obtuse angle."
26. Determine whether the conjecture is true or not. If not, write or draw a counterexample.
- a. Points Q and R are collinear.
 - b. If J is between H and K , then $HJ = JK$.
27. For each conditional, underline the hypothesis and double-underline the conclusion.
- a. Is x is an even number, then x is divisible by 2.
 - b. The circumference of a circle is 5π inches if the diameter of the circle is 5 inches.
28. Write a conditional statement from the given statement below.
"Congruent segments have equal measures."

29. Write the converse, inverse, and contrapositive of the conditional statement given. Then find the truth value of each.

“If an angle has a measure of less than 90° , then it is acute.”

30. Tell whether the conclusion uses inductive or deductive reasoning.

- a. A sign in the cafeteria says that a car wash is being held on the last Saturday of May. Tomorrow is the last Saturday of May, so Justin concludes that the car wash is tomorrow.
- b. So far, at the beginning of every Latin class, the teacher has had students review vocabulary. Latin class is about to start, so Jamilla assumes that they will review vocabulary.

31. Determine whether each conjecture is valid by the Law of Detachment.

- a. **Given:** If you ride the Titan roller coaster in Arlington, Texas, then you will drop 255 feet. Miachel rode the Titan roller coaster.
Conjecture: Michael dropped 255 feet.
- b. **Given:** A segment that is a diameter of a circle has endpoints on the circle. $\overline{GH}$ has endpoints on a circle.
Conjecture: $\overline{GH}$ is a diameter.

32. Determine whether each conjecture is valid by the Law of Syllogism.

- a. **Given:** If you buy a car, then you can drive to school. If you can drive to school, then you will not ride the bus.
Conjecture: If you buy a car, then you will not ride the bus.
- b. **Given:** If $\angle K$ is obtuse, then it does not have a measure of 90° . If an angle does not have a measure of 90° , then it is not a right angle.
Conjecture: If $\angle K$ is obtuse, then it is not a right angle.

33. Write the conditional statement and converse within the biconditional below.

“ $m\angle ABC = m\angle CBD$ if and only if $\overrightarrow{BC}$ is an angle bisector of $\angle ABD$.”

34. For the conditional below, write the converse and the biconditional statement.

“If a figure has 10 sides, then it is a decagon.”

35. Determine if the biconditional below is true. If false, give a counterexample.

“An angle in a triangle measures 90° if and only if the triangle is a right triangle.”

36. Write the definition below as a biconditional.

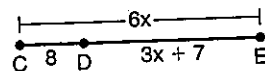
“An isosceles triangle has at least two congruent sides.”

37. Solve the equation. Write a justification for each step.

$$\frac{n}{6} - 3 = 10$$

38. Write a justification for each step.

Statements	Reasons
$CE = CD + DE$	
$6x = 8 + (3x + 7)$	
$6x = 15 + 3x$	
$3x = 15$	
$x = 5$	



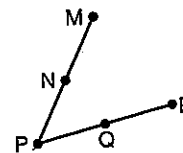
39. Identify the property that justifies each statement.

- If $\angle ABC \cong \angle DEF$, then $\angle DEF \cong \angle ABC$ _____
- $\angle 1 \cong \angle 2$ and $\angle 2 \cong \angle 3$, so $\angle 1 \cong \angle 3$ _____
- If $FG = HJ$, then $HJ = FG$ _____
- $\overline{WX} \cong \overline{XW}$ _____

40. Write a justification for each step.

Given: N is the midpoint of $\overline{MP}$, Q is the midpoint of $\overline{RP}$, and $\overline{PQ} \cong \overline{NM}$

Prove: $\overline{PN} \cong \overline{QR}$



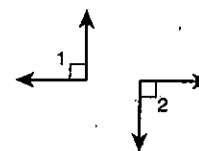
Statements	Reasons
N is the midpoint of $\overline{MP}$	
Q is the midpoint of $\overline{RP}$	
$\overline{PN} \cong \overline{NM}$	
$\overline{PQ} \cong \overline{NM}$	
$\overline{PN} \cong \overline{PQ}$	
$\overline{PQ} \cong \overline{QR}$	
$\overline{PN} \cong \overline{QR}$	

41. Fill in the blanks to complete the two-column proof of the Right Angle Congruence Theorem.

Given: $\angle 1$ and $\angle 2$ are right angles

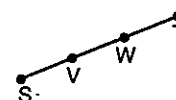
Prove: $\angle 1 \cong \angle 2$

Statements	Reasons
	Given
$m\angle 1 = 90^\circ$	
	Definition of a right angle
$m\angle 1 = m\angle 2$	
	Equal angles are congruent



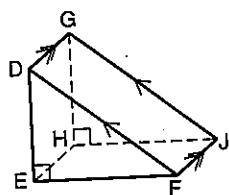
42. Use the given two-column proof on this page to write a flow-chart proof on the next page.

Statements	Reasons
1. V is the midpoint of $\overline{SW}$.	1. Given
2. W is the midpoint of $\overline{VT}$.	2. Given
3. $\overline{SV} \cong \overline{VW}$, $\overline{VW} \cong \overline{WT}$	3. Definition of midpoint
4. $\overline{SV} \cong \overline{WT}$	4. Transitive Property of Equality



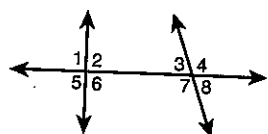
CHAPTER 3

43. Use the figure below to identify each of the following:



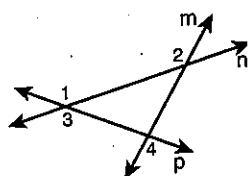
- A segment that is parallel to $\overline{DG}$
- A segment that is perpendicular to $\overline{GH}$
- A segment that is skew to $\overline{JF}$
- One pair of parallel planes
- One pair of perpendicular segments, not including $\overline{GH}$
- One pair of skew segments, not including $\overline{JF}$

44. Use the figure to give an example of each type of angle pair.



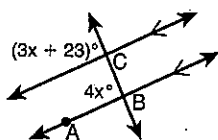
- Corresponding angles
- Same-side interior angles

45. Use the figure to identify the transversal and classify each angle pair.

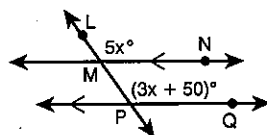


- $\angle 1$ and $\angle 2$
- $\angle 4$ and $\angle 2$
- $\angle 3$ and $\angle 4$

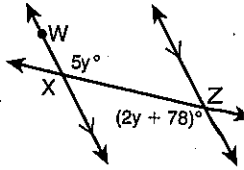
46. Find $m\angle ABC$



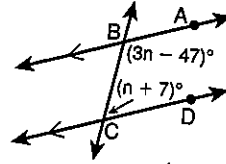
47. Find $m\angle MPQ$



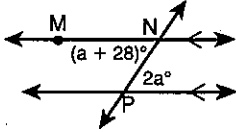
48. Find $m\angle WXZ$



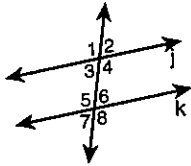
49. Find $m\angle ABC$



50. Find $m\angle MNP$



51. Determine whether the given information is enough to show that $j \parallel k$

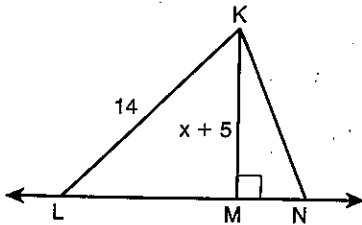


a. $\angle 4 \cong \angle 5$

b. $m\angle 3 = 12x^\circ$, $m\angle 5 = 18x^\circ$, and $x = 6$

c. $m\angle 2 = 8x^\circ$, $m\angle 7 = (7x + 9)^\circ$, and $x = 9$

52. Name the shortest segment from point K to $\overline{LN}$, then write and solve an inequality for x.

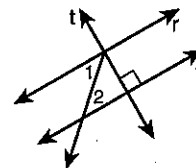


53. Complete the two-column proof.

Given: $\angle 1 \cong \angle 2$ and $s \perp t$

Prove: $r \perp t$

Statements	Reasons
$\angle 1 \cong \angle 2$	Given
	If Alt. Int. $\angle s \cong \rightarrow \parallel$
$s \perp t$	Given
$r \perp t$	



54. Use the slope formula to determine the slope of each line with the given points.

a. Line passing through M(-2, 0) and L(1, 6)

b. Line passing through R(3, 1) and S(6, -3)

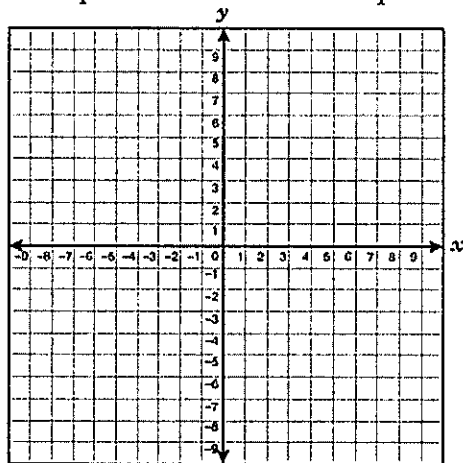
55. Use slopes to determine whether each pair of distinct lines is parallel, perpendicular, or neither.

a. Slope of $\overleftrightarrow{PQ} = 5$ and slope of $\overleftrightarrow{JK} = -\frac{1}{5}$

b. Slope of $\overleftrightarrow{EF} = -\frac{3}{4}$ and slope of $\overleftrightarrow{CD} = -\frac{3}{4}$

c. Slope of $\overleftrightarrow{WX} = \frac{1}{2}$ and slope of $\overleftrightarrow{YZ} = -\frac{1}{2}$

56. Graph the lines and use slopes to determine whether the lines are parallel, perpendicular, or neither.



$\overleftrightarrow{FG}$ passing through F(-1, 2) and G(3, -4)

$\overleftrightarrow{HJ}$ passing through H(-2, -3) and J(4, 1)

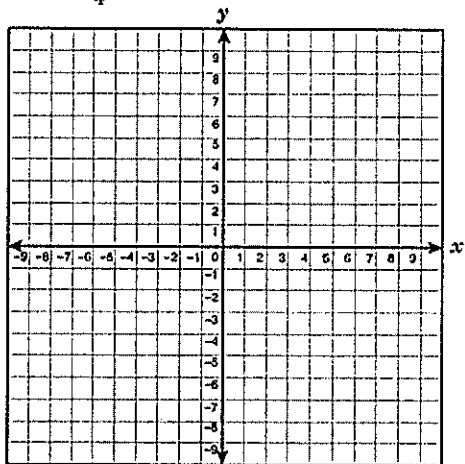
57. Write the equation of each line in slope-intercept form.

a. The line through (4, 2) and (8, 5)

b. The line through (-5, 1) with slope of 2

c. The line with x-intercept of -5 and y-intercept of 3

58. Graph $y = -\frac{1}{3}x + 3$ in one color, and $y - 2 = \frac{1}{4}(x + 1)$ in a different color.



59. Determine whether the lines are parallel, intersect, or coincide.

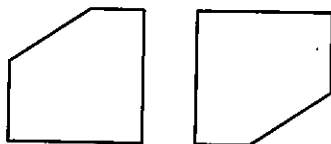
a. $y = 2x + 5$
 $y = 2x - 5$

b. $y = 5x - 2$
 $x + 4y = 8$

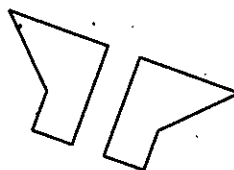
CHAPTER 4

60. Tell whether each transformation appears to be a reflection.

a.

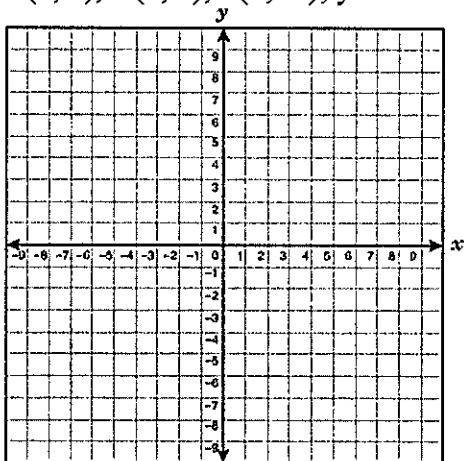


b.

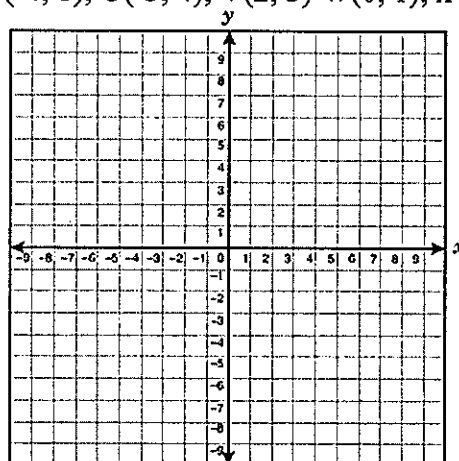


61. Reflect the figure with the given vertices across the given line.

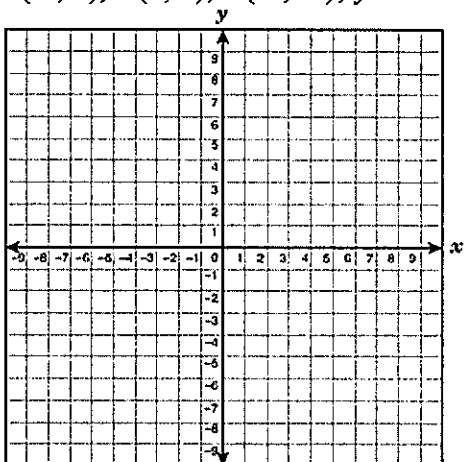
a. M(2, 4), N(4, 2), P(3, -2); y-axis



b. T(-4, 1), U(-3, 4), V(2, 3) W(0, 1); x-axis

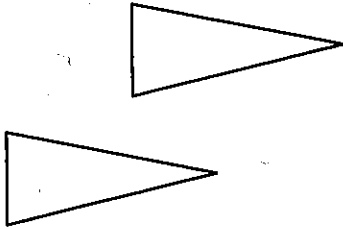


c. A(-2, 4), B(1, 1), C(-5, -1); $y = x$

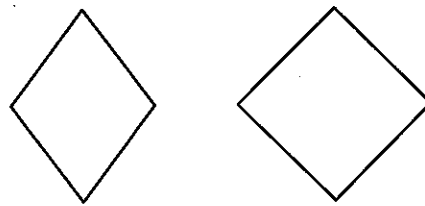


62. Tell whether each transformation appears to be a translation.

a.

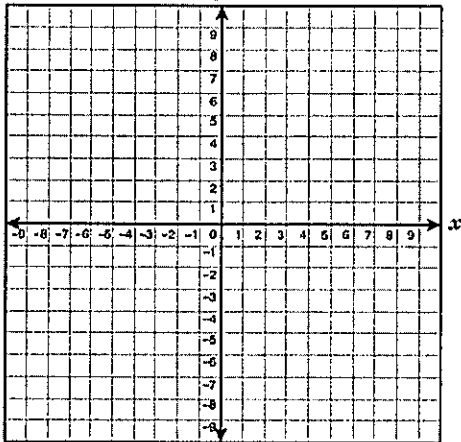


b.

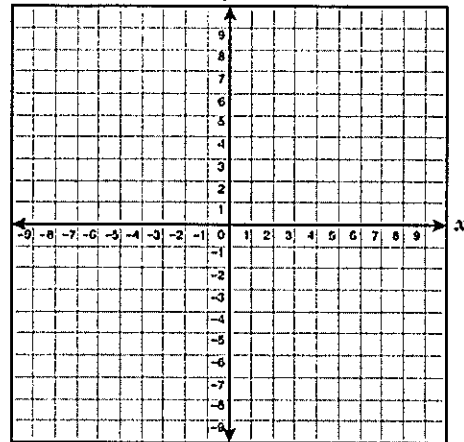


63. Translate the figure with the given vertices along the given vector.

a. $E(-2, -4), F(3, 0), G(3, -4); \langle 0, 3 \rangle$

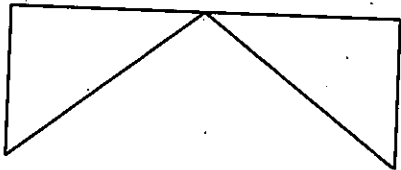


b. $A(1, -2), B(1, 0), C(3, 1), D(4, -3); \langle -5, 3 \rangle$

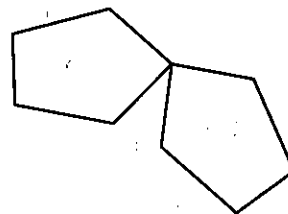


64. Tell whether each transformation appears to be a rotation.

a.

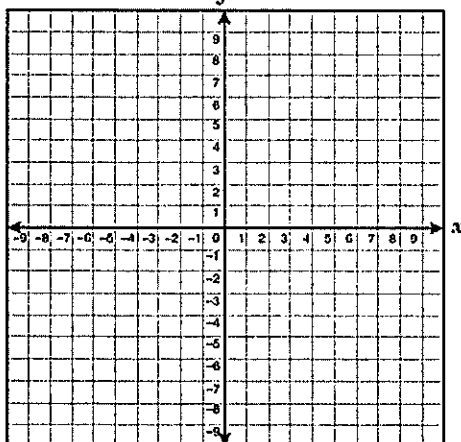


b.

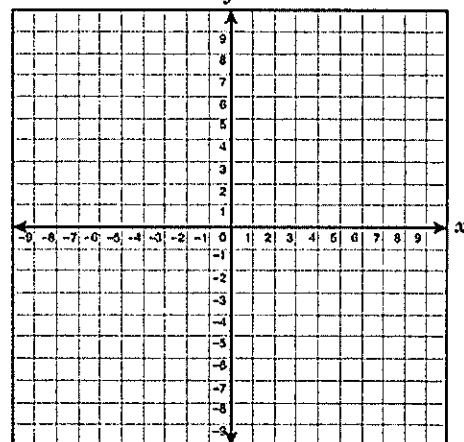


65. Rotate the figure with the given vertices about the origin using the given angle.

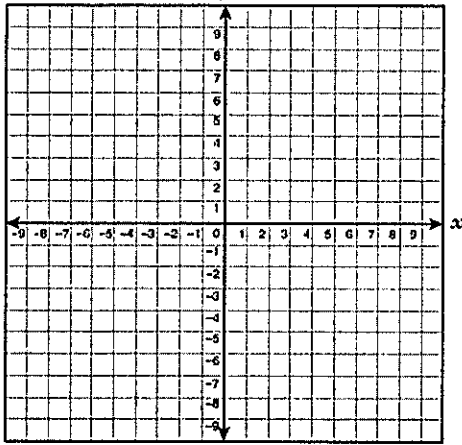
a. $R(0, 0), S(3, 1), T(2, 4); 90^\circ$



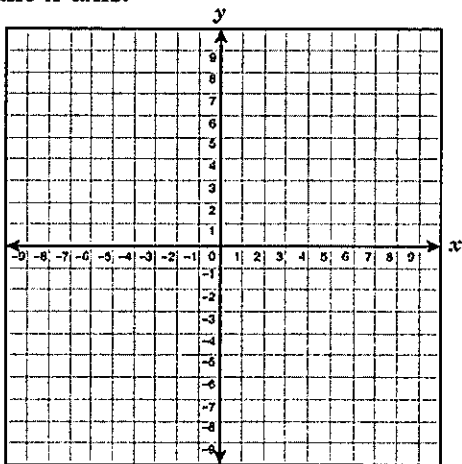
b. $E(0, 3), F(3, 5), G(4, 0); 180^\circ$



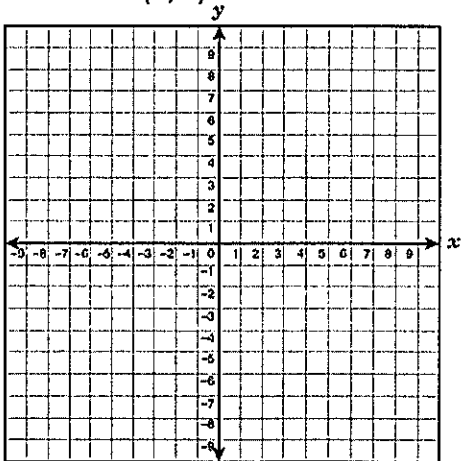
c. $U(1, -1)$, $V(4, -2)$, $W(3, -4)$; 90° clockwise



66. $\triangle ABC$ has vertices $A(0, -1)$, $B(3, 4)$, and $C(3, 1)$. Rotate $\triangle ABC$ 180° about the origin and then reflect it across the x-axis.

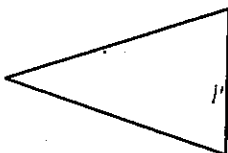


67. $\triangle QRS$ has vertices $Q(2, 1)$, $R(4, -2)$ and $S(1, -3)$. Reflect $\triangle QRS$ across the y-axis and then translate it along the vector $\langle 1, 3 \rangle$

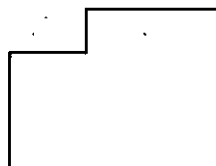


68. Tell whether each figure has line symmetry. If so, draw all lines of symmetry.

a.



b.

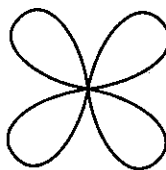


69. Tell whether each figure has rotational symmetry. If so, give the angle of rotational symmetry and the order of symmetry.

a.

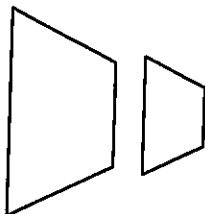


b.

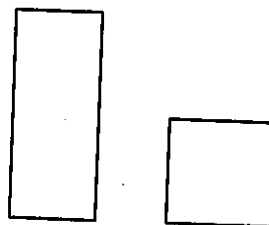


70. Tell whether each transformation appears to be a dilation.

a.

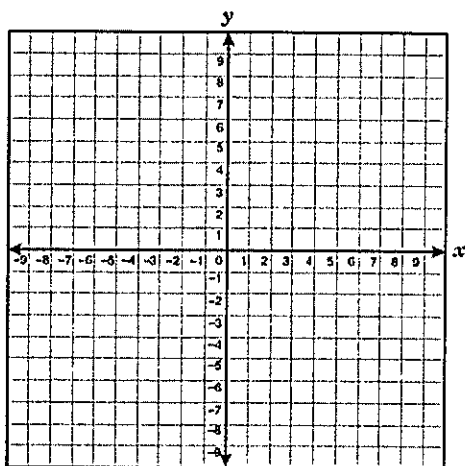


b.

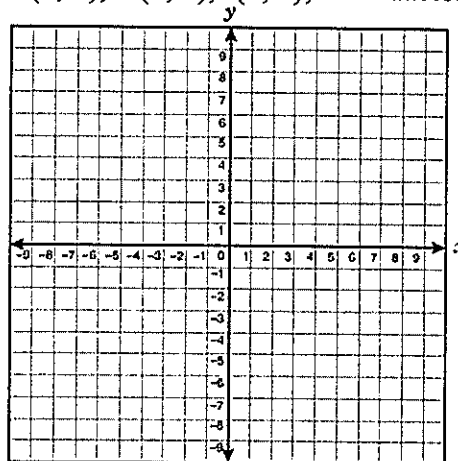


71. Draw the image of the figure with the given vertices under a dilation with the given scale factor and centered at the origin.

a. $J(0, 0)$, $K(-1, 2)$, $L(3, 4)$; scale factor of 2



b. $G(2, 0)$, $H(0, 4)$, $I(4, 2)$; scale factor of $-\frac{1}{2}$



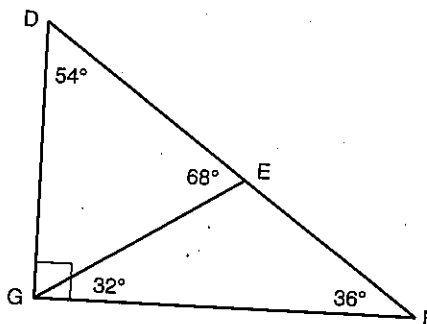
CHAPTER 5

72. Classify each triangle by its angle measures.

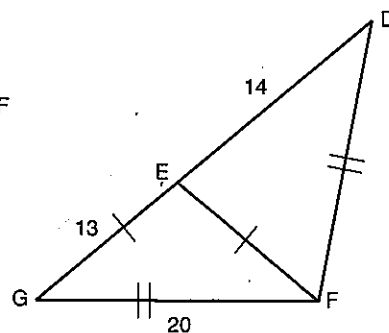
a. $\triangle DFG$ _____

b. $\triangle DEG$ _____

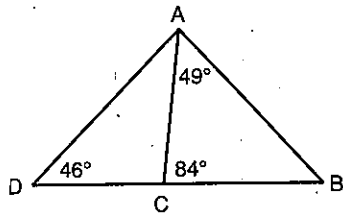
c. $\triangle EFG$ _____



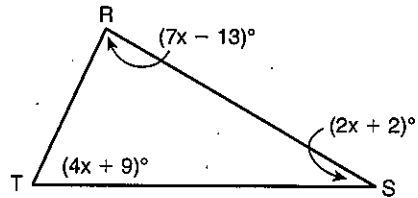
73. Classify $\triangle DEF$ by its side lengths.



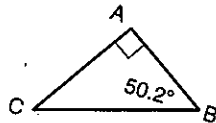
74. Find $m\angle ABC$.



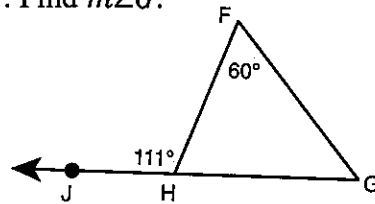
75. What is the value of x ?



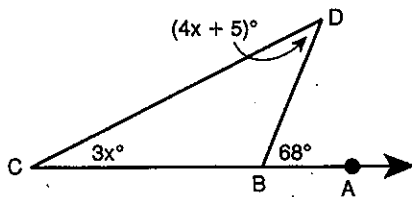
76. Find $m\angle C$.



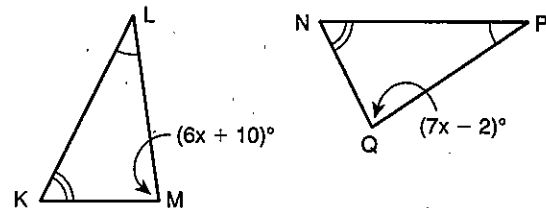
77. Find $m\angle G$.



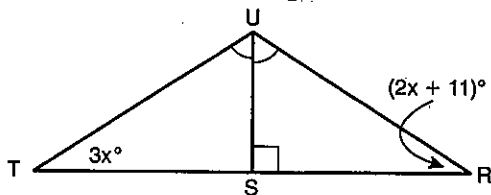
77. Find $m\angle D$



79. Find $m\angle M$ and $m\angle Q$.



78. Find $m\angle T$ and $m\angle R$.



79. Given $\triangle XYZ \cong \triangle NPQ$, identify the congruent corresponding parts.

a. $\angle Z \cong$ _____

d. $\overline{NQ} \cong$ _____

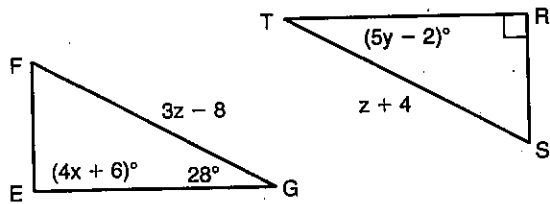
b. $\angle P \cong$ _____

e. $\overline{YZ} \cong$ _____

c. $\angle X \cong$ _____

f. $\overline{PN} \cong$ _____

80. Given $\triangle EFG \cong \triangle RST$, find the values of x and y .

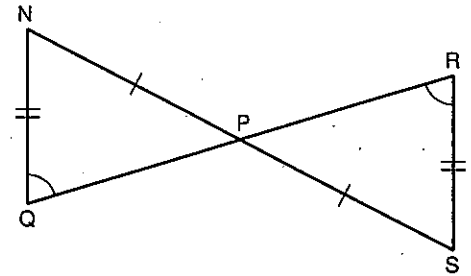


81. Complete the proof.

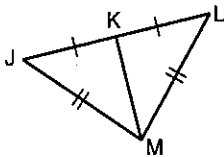
Given: $\angle Q \cong \angle R$, P is the midpoint of $\overline{QR}$, $\overline{NQ} \cong \overline{SR}$, and $\overline{NP} \cong \overline{SP}$

Prove: $\triangle SPR \cong \triangle NPQ$

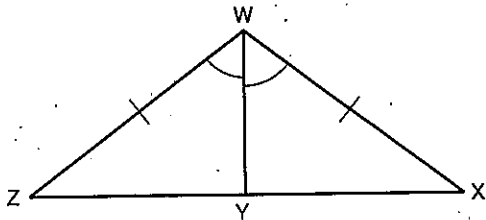
Statements	Reasons
$\angle Q \cong \angle R$	Given
$\angle NPQ \cong \angle SPR$	
$\angle N \cong \angle S$	
P is the midpoint of $\overline{QR}$	
	Definition of a midpoint
$\overline{NQ} \cong \overline{SR}$, and $\overline{NP} \cong \overline{SP}$	
$\triangle SPR \cong \triangle NPQ$	



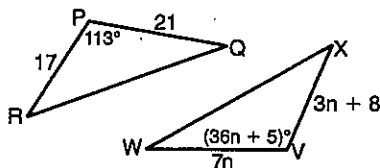
82. Use $SSS \cong$ to explain why $\triangle JKM \cong \triangle LKM$.



83. Use $SAS \cong$ to explain why $\triangle WXY \cong \triangle WZY$



84. Show that $\triangle PQR \cong \triangle VWX$ for $n = 3$.

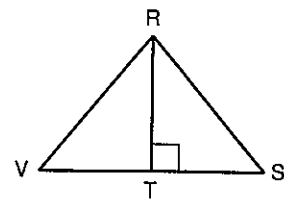


85. Complete the proof.

Given: T is the midpoint of $\overline{VS}$ and $\overline{RT} \perp \overline{VS}$

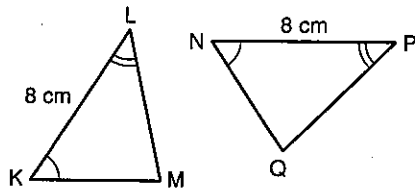
Prove: $\triangle RST \cong \triangle RVT$

Statements	Reasons
T is the midpoint of $\overline{VS}$	Given
	Definition of a midpoint
$\overline{RT} \perp \overline{VS}$	Given
	All right angles are congruent
$\overline{RT} \cong \overline{RT}$	
$\triangle RST \cong \triangle RVT$	

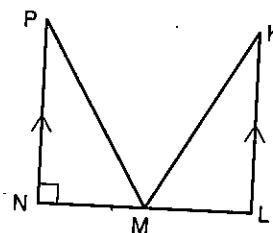


86. Determine whether you can use $ASA \cong$ to show that the triangles are congruent.

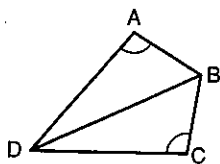
a. $\triangle KLM$ and $\triangle NPQ$



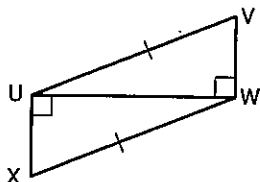
b. $\triangle KLM$ and $\triangle PNM$, given that M is the midpoint of $\overline{NL}$



87. Describe the corresponding parts and the justifications for using them to prove that $\triangle ABD \cong \triangle CBD$ by $AAS \cong$, given that $\overline{BD}$ is the angle bisector of $\angle ADC$.



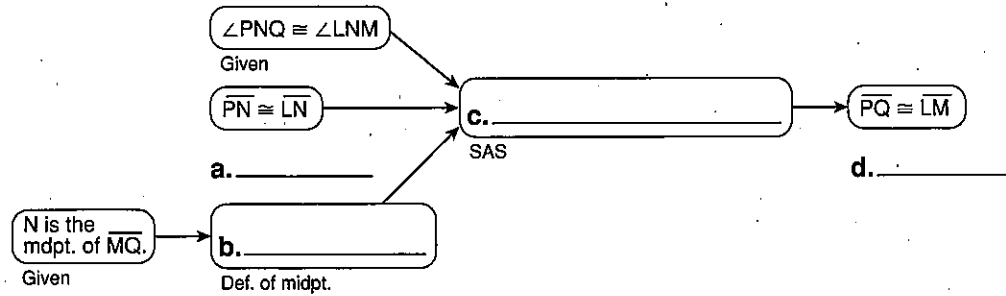
88. Determine whether you can use $HL \cong$ to prove that $\triangle UVW \cong \triangle WXU$. If yes, explain. If not, tell what else you need to know.



89. Complete each proof.

Given: $\angle PNQ \cong \angle LNM$, $\overline{PN} \cong \overline{LN}$, and N is the midpoint of $\overline{QM}$

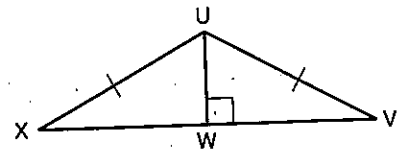
Prove: $\overline{PQ} \cong \overline{LM}$



90. Complete the proof.

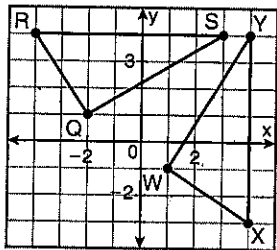
Given: $\triangle UXW$ and $\triangle UVW$ are right triangles and $\overline{UX} \cong \overline{UV}$

Prove: $\angle X \cong \angle V$



Statements	Reasons
$\triangle UXW$ and $\triangle UVW$ are right triangles	Given
$\overline{UX} \cong \overline{UV}$	
$\overline{UW} \cong \overline{UW}$	
$\angle X \cong \angle V$	

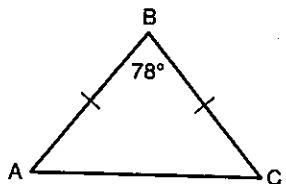
91. Use the graph to prove that $\angle RSQ \cong \angle XYW$



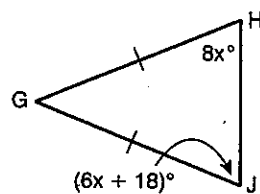
92. Position a square with side lengths of 6 units in the coordinate plane and give coordinates of each vertex.

93. Position a rectangle with leg lengths l and w in the coordinate plane and give coordinates to each vertex.

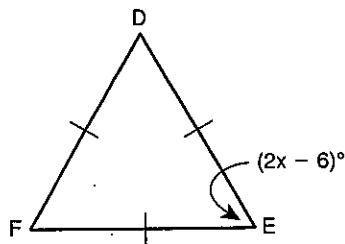
94. Find $m\angle C$.



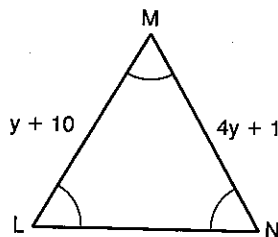
95. Find $m\angle H$



96. Find the value of x .

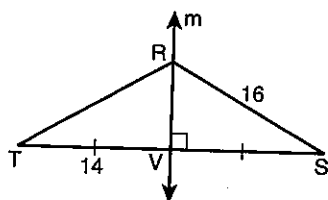


97. Find MN .



CHAPTER 6

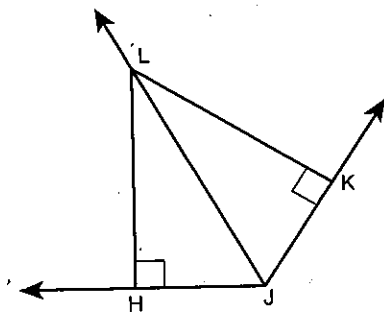
97. Find RT .



98. Write an equation in slope-intercept form for the perpendicular bisector of the segments with endpoints $A(6, -3)$ and $B(0, 5)$

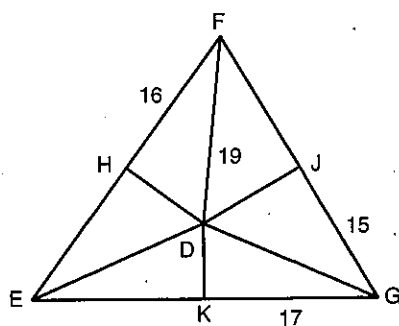
99. Use the figure below for parts (a) and (b).

a. Given that $LH = 26$, $LK = 26$, and $m\angle HJK = 22^\circ$, find $m\angle LJK$



b. Given that $LH = LK$, $m\angle HJL = (3y + 19)^\circ$ and $m\angle LJK = (4y + 5)^\circ$, find the value of y .

100. $\overline{HD}$, $\overline{JD}$ and $\overline{KD}$ are the perpendicular bisectors of $\triangle EFG$. Find each length below.



a. $DG =$ _____

b. $EK =$ _____

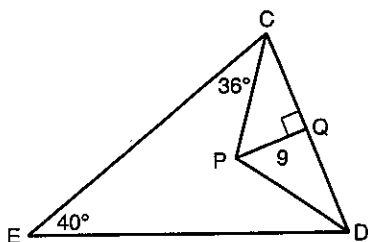
c. $FJ =$ _____

101. Find the circumcenter of the triangle with vertices at $O(0, 0)$, $J(4, 0)$ and $K(0, 6)$.

102. $\overline{PC}$ and $\overline{PD}$ are the angle bisectors of $\triangle CDE$. Find each measure.

a. The distance from P to $\overline{CE}$ _____

b. $m\angle PDE =$ _____



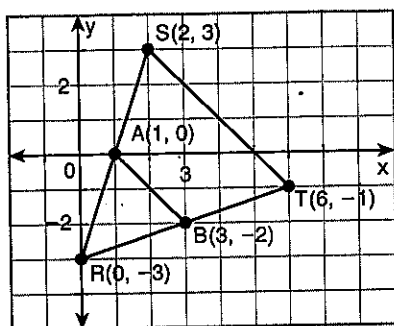
103. $\overline{AB}$ is a midsegment of $\triangle RST$.

a. What is the slope of midsegment $\overline{AB}$ and the slope of side $\overline{ST}$?

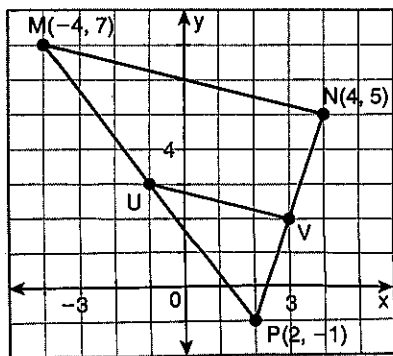
b. What can you conclude about $\overline{AB}$ and $\overline{ST}$?

c. Find AB and ST

d. Compare the lengths of $\overline{AB}$ and $\overline{ST}$



104. $\overline{UV}$ is a midsegment of $\triangle MNP$. Find the coordinates of U and V given that $P(2, -1)$, $N(4, 5)$, and $M(-4, 7)$, and that $\overline{UV} \parallel \overline{MN}$.



105. Find each measure.

a. $ST =$ _____

b. $DE =$ _____

c. $m\angle DES =$ _____

d. $m\angle RCD =$ _____

