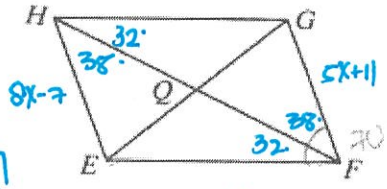
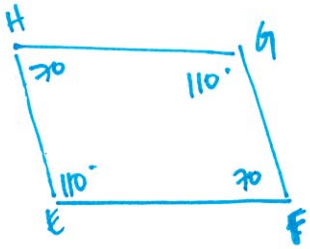
# Homework #49
# Pages 197 - 199
# Chapter Review and Test

## Chapter Review

**In parallelogram $EFGH$, $m\angle EFG = 70$.**

1. $m\angle HEF =$ ? 110
2. If $m\angle EFH = 32$, then $m\angle EHF =$ ? 38
3. If $HQ = 14$, then $HF =$ ? 28
4. If $EH = 8x - 7$ and $FG = 5x + 11$, then $x =$ ? 6

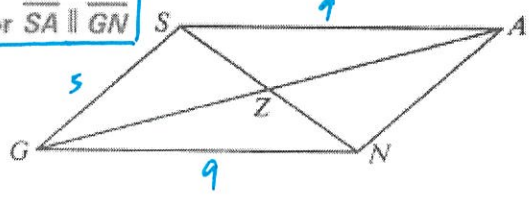


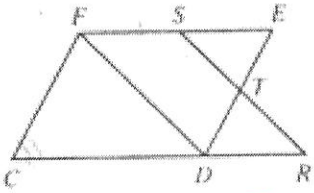

$8x-7 = 5x+11$
$3x = 18$
$x = 6$

**In each exercise you could prove that quad. $SANG$ is a parallelogram if one more fact, in addition to those stated, were given. State that fact.**

5. $GN = 9$; $NA = 5$; $SA = 9$ $\overline{GS} = 5$ or $\overline{SA} \parallel \overline{GN}$
6. $\angle ASG \cong \angle GNA$ $\angle SAN \cong \angle SGN$
7. $\overline{SZ} \cong \overline{NZ}$ $\overline{AZ} \cong \overline{GZ}$
8. $\overline{SA} \parallel \overline{GN}$; $SA = 17$ $GN = 17$



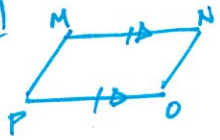

12. Given: $\square CDEF$; $S$ and $T$ are the midpoints of $\overline{EF}$ and $\overline{ED}$.
Prove: $\overline{SR} \cong \overline{FD}$




**Give the most descriptive name for quad. $MNOP$.**

13. $\overline{MN} \cong \overline{PO}$; $\overline{MN} \parallel \overline{PO}$ parallelogram
14. $\overline{MN} \parallel \overline{PO}$; $\overline{NO} \parallel \overline{MP}$; $\overline{MO} \perp \overline{NP}$ rhombus
15. $\angle M \cong \angle N \cong \angle O \cong \angle P$ rectangle
16. $MNOP$ is a rectangle with $MN = NO$. square

13.

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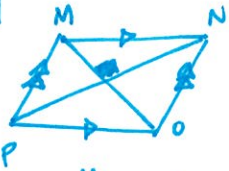


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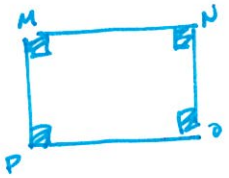


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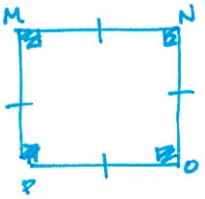
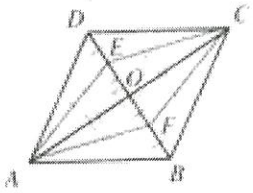



17. Given: $ABCD$ is a rhombus;
$DE = BF$
Prove: $AECF$ is a rhombus.

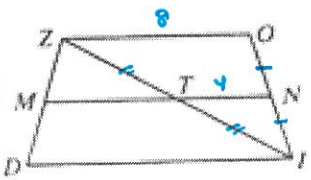



**Draw and label a diagram. List, in terms of the diagram, what is given and what is to be proved. Then write a proof.**

18. $\overline{PX}$ and $\overline{QY}$ are altitudes of acute $\triangle PQR$, and $Z$ is the midpoint of $\overline{PQ}$.
Prove that $\triangle XYZ$ is isosceles.

**$\overline{MN}$ is the median of trapezoid $ZOID$.** $\overline{ZO}, \overline{DI}$

19. The bases of trap. $ZOID$ are ? and ?
20. If $ZO = 8$ and $MN = 11$, then $DI =$ ? 14
21. If $ZO = 8$, then $TN =$ ? 4
22. If trap. $ZOID$ is isosceles and $m\angle D = 80$, then $m\angle O =$ ? 100



# Chapter Test

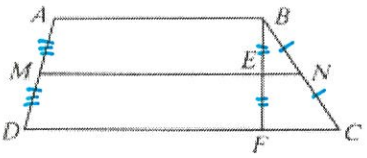
**Complete each statement with the word *always*, *sometimes*, or *never*.**

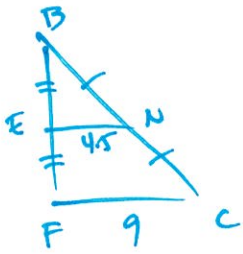
1. A square is ? a rectangle. always
2. A rectangle is ? a rhombus. sometimes
3. A rhombus is ? a square sometimes
4. A rhombus is ? a parallelogram. always
5. A trapezoid ? has three congruent sides. sometimes
6. The diagonals of a trapezoid ? bisect each other. never
7. The diagonals of a rectangle are ? congruent. always
8. The diagonals of a parallelogram ? bisect the angles. sometimes

**Trapezoid *ABCD* has median $\overline{MN}$.**

9. If $DC = 42$ and $MN = 35$, then $AB =$ ? 28
10. If $FC = 9$, then $EN =$ ? $4\frac{1}{2}$
11. If $AB = 5j + 7k$ and $DC = 9j - 3k$, then $MN =$ ? $7j + 2k$

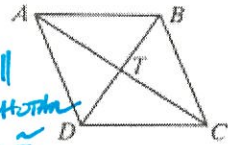
$MN = \frac{5j+7k+9j-3k}{2}$



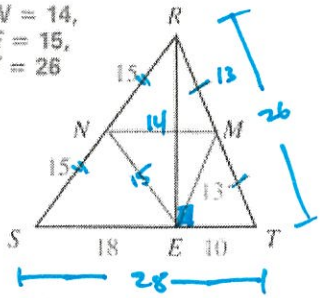

**Can you deduce from the given information that quad. *ABCD* is a parallelogram? If so, what theorem can you use?**

12. $\angle ADC \cong \angle CBA$ and $\angle BAD \cong \angle DCB$ ☐ - OPP. ∠s ≅
13. $\overline{AD} \parallel \overline{BC}$ and $\overline{AD} \cong \overline{BC}$ ☐ - 1 PAIR OF OPP. SIDES ≅ & ∥
14. $AT = CT$ and $DT = \frac{1}{2}DB$ ☐ - DIAGONALS BISECT EACH OTHER
15. $\overline{AB}$, $\overline{BC}$, $\overline{CD}$, and $\overline{DA}$ are all congruent. ☐ - OPP. SIDES ≅

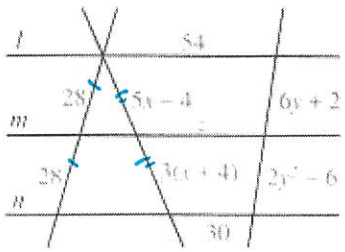



16. $\overline{RE}$ is an altitude of $\triangle RST$. Find $MN$, $NE$, and $RT$.

$MN = 14$, $NE = 15$, $RT = 26$

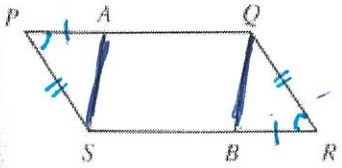



17. $l \parallel m \parallel n$ Find the values of $x$, $y$, and $z$.

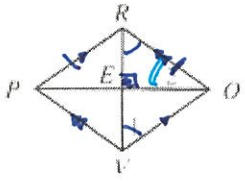



$x = 8$, $y = 4$, $z = 42$

18. Given: $\square PQRS$; $PA = RB$ Prove: $AS = BQ$




19. Given: $\overline{PR} \parallel \overline{VO}$; $\overline{RO} \parallel \overline{PV}$; $\overline{PR} \cong \overline{RO}$ Prove: $\angle 1$ and $\angle 2$ are complementary.




(1) $\square PQRS$, $PA = RB$ (1) GIVEN
(2) $\overline{PA} \cong \overline{RB}$ (2) DEF. OF CONGRUENT SEGMENTS
(3) $\angle P \cong \angle R$ (3) IN A PARALLELOGRAM, OPPOSITE ANGLES ARE CONGRUENT
(4) $\overline{PS} \cong \overline{RQ}$ (4) IN A PARALLELOGRAM, OPPOSITE SIDES ARE CONGRUENT
(5) $\triangle PSA \cong \triangle RQB$ (5) SAS
(6) $\overline{AS} \cong \overline{BQ}$ (6) CPCTC
(7) $AS = BQ$ (7) DEF. OF CONGRUENT SEGMENTS

$5x - 4 = 3(x+4)$
$5x - 4 = 3x + 12$
$2x = 16$
$x = 8$

$6y + 2 = 2y^2 - 6$
$2y^2 - 6y - 8 = 0$
$2(y^2 - 3y - 4) = 0$
$(y-4)(y+1) = 0$
$y = 4$ $y = -1$

$z = \frac{54+130}{2}$
$z = \frac{84}{2}$
$z = 42$

18

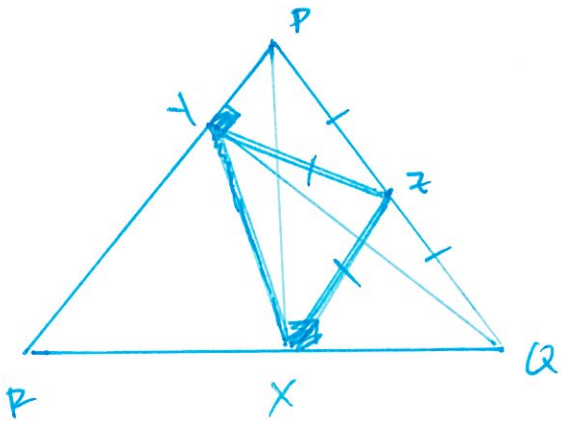
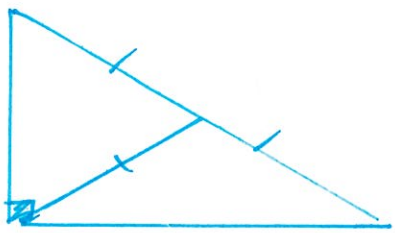
(1) $\overline{PX}$ and $\overline{QY}$ are altitudes of acute $\triangle PQR$ (1) Given
- Z is the midpoint of $\overline{PQ}$

(2) $\angle PYQ$ and $\angle PXQ$ are right angles (2) Def. of Altitudes

(3) $\triangle PYQ$ and $\triangle PXQ$ are right triangles (3) Def. of right triangles

(4) $\overline{PZ} \cong \overline{QZ}$ (4) Def. of Midpoint

(5) $\overline{YZ} \cong \overline{PZ}$
$\overline{XZ} \cong \overline{PZ}$
(5) The midpoints of the hypotenuse of a right triangle is equidistant from the three vertices.

(6) $\overline{YZ} \cong \overline{XZ}$ (6) Substitution property of congruence

(7) $\triangle XYZ$ is isosceles $\triangle$ (7) Def. of isosceles triangle.