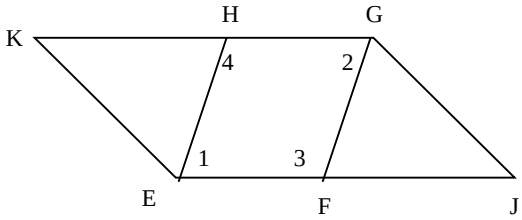
Honors Geometry Chapter 7 Review

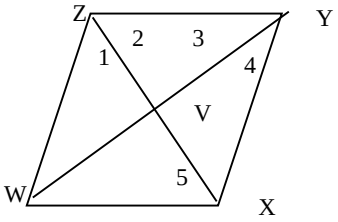
- Study definitions & theorems for always, sometimes, & never true questions.
  a) A parallelogram ___ has congruent consecutive sides.
  b) The diagonals of a parallelogram are ___ congruent.
  c) Both pairs of opposite angles of a trapezoid are ___ congruent.
  d) A parallelogram with four right angles is ___ a square.

- Know how to identify if the quadrilateral is rectangle, rhombus, square, etc.

Proofs: Know how to prove something is a parallelogram.

Given: $\angle 1 \cong \angle 2$, $\angle 3 \cong \angle 4$, HK = FJ
Prove: KEJG is a parallelogram

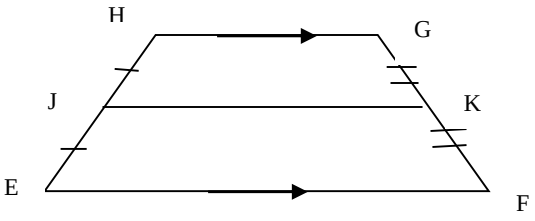




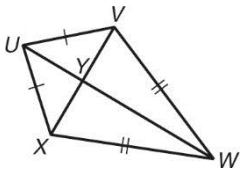
Sample Problems:

1. $\Delta WYZ \cong$____
2. $\angle ZWX \cong$____
3. If m $\angle WXY$ = 13x-7 and m$\angle YZW$= 9x +29, then m$\angle WXY$ =___. (numerical answer)
4. If m$\angle 1$ = ___, m$\angle 2$ = 64, and m$\angle 3$ =38, then (a) WY= ___ and (b) m$\angle 5$=__
5. If WV = 4y + 2, YV = 6y, and ZV = 3y, then (a) WY = ___ and (b) XZ= ___
6. If XY = 15t – 3, YZ = 10t + 2, and WZ = 9t + 21, then t = ___

7. $\overline{JK}$ is the ___ of the trapezoid.
8. If EH = FG and m$\angle$E = 65, then (a) m$\angle$G = ___ (b) m$\angle$ GKJ=___
9. If EF = 36, JK = 4x, and GH = 2x + 6, then x = ___



10. In kite *UVWX*, m$\angle XUV$ = 84°, and m$\angle WVX$ = 68°. What is m$\angle VWX$?



11. Which is the best name for the quadrilateral with vertices at (2, 2), (5, –2), (1, –5), and (–2, –1)?

12. An interior angle of a regular convex polygon measures 120^0. How many sides does the polygon have?

13. If an exterior angle of a polygon measures 40 degrees, what is the measure of the interior angle adjacent to it?

Answers:
a) sometimes b) sometimes c) never d) sometimes

1. ΔYWX
2. ∠XYZ
3. 110
4. a. 30 b. 64
5. a. 12 b. 6
6. 4
7. median
8. a. 115 b. 65
9. 7
10. 44^0
11. square
12. 6
13. 140

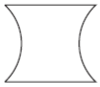
*There is more than 1 way to prove this
Proof:

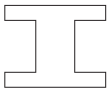
1) ----	1) Given
2) HEFG is a parallelogram	2) opposite angles of a parallelogram congruent
3) $\overline{HG} \cong \overline{EF}$	3) opp side so of a parallelogram congruent
4) $\overline{HG} \parallel \overline{EF}$	4) defn of parallelogram
5) GH + HK = GK EF + FJ = EJ	5) segment addition
6) GK = EJ	6) Transitive
7) KEJG is a parallelogram	7) 1 pair of opp sides || and congruent

Additional Practice:

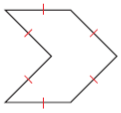
Tell whether each figure is a polygon. If it is a polygon, name it by the number of its sides.

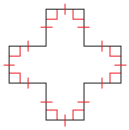
1. 

2. 

3. 

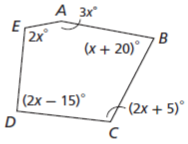
Tell whether each polygon is regular or irregular. Tell whether it is concave or convex.

4. 

5. 

6. 

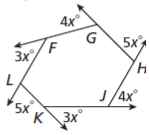
7. Find the measure of each interior angle of pentagon *ABCDE*.



8. Find the sum of the interior angle measures of a convex heptagon.

9. Find the measure of each interior angle of a regular 15-gon.

10. Find the value of x in polygon *FGHJKL*.



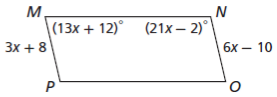
11. Find the measure of each exterior angle of a regular dodecagon.

MNOP is a parallelogram. Find each measure.

12. *MP*

13. m∠*M*

14. m∠*N*



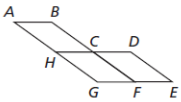
Three vertices of $\square QRST$ are given. Find the coordinates of T.

15. $Q(-5, 3)$, $R(3, 6)$, $S(6, 4)$

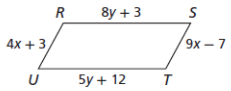
16. $Q(-1, 7)$, $R(3, 3)$, $S(-2, 3)$

Write a two-column proof.

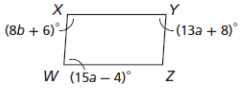
17. Given: *ABFG* and *HDEG* are parallelograms.
Prove: $\angle B \cong \angle D$



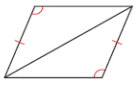
18. Show that *RSTU* is a parallelogram for $x = 2$ and $y = 3$.

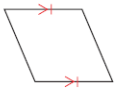


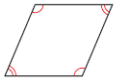
19. Show that *WXYZ* is a parallelogram for $a = 6$ and $b = 11$.



Determine if each quadrilateral must be a parallelogram. Justify your answer.

20. 

21. 

22. 

Show that the quadrilateral with the given vertices is a parallelogram.

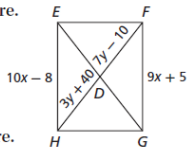
23. $W(0, 0)$, $X(-3, 3)$, $Y(5, 5)$, $Z(8, 2)$

24. $A(-3, 1)$, $B(-2, 4)$, $C(1, 2)$, $D(0, -1)$

EFGH is a rectangle. Find each measure.

25. *EH*

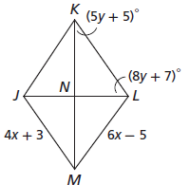
26. *HF*



JKLM is a rhombus. Find each measure.

27. *JK*

28. m∠*NKL*

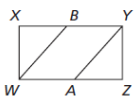


Show that the diagonals of a square with the given vertices are congruent perpendicular bisectors of each other.

29. $N(1, 4)$, $P(4, 1)$, $Q(1, -2)$, $R(-2, 1)$

30. $S(-2, 7)$, $T(2, 8)$, $U(3, 4)$, $V(-1, 3)$

31. Given: $\overline{WXYZ}$ is a rectangle. $\overline{XB} \cong \overline{AZ}$
Prove: $\overline{WB} \cong \overline{YA}$

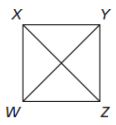


Determine if the conclusion is valid. If not, tell what additional information is needed to make it valid.

32. Given: $\overline{XY} \parallel \overline{WZ}$, $\overline{XY} \cong \overline{WZ}$, $\overline{XZ} \perp \overline{WY}$
Conclusion: *WXYZ* is a rhombus.

33. Given: $\overline{WX} \cong \overline{XY}$
Conclusion: *WXYZ* is a square.

34. Given: $\overline{WX} \perp \overline{XY}$, $\overline{WX} \perp \overline{WZ}$
Conclusion: *WXYZ* is a rectangle.



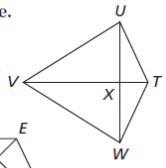
Use the diagonals to determine whether a parallelogram with the given vertices is a rectangle, rhombus, or square. Give all the names that apply.

Use the diagonals to determine whether a parallelogram with the given vertices is a rectangle, rhombus, or square. Give all the names that apply.

35. $A(1, 0), B(2, -4), C(6, -3), D(5, 1)$ **36.** $E(-3, -1), F(-4, -4), G(2, -6), H(3, -3)$

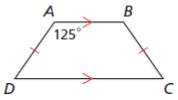
In kite $TUVW$, $m\angle XTU = 65°$, and $m\angle UVT = 32°$. Find each measure.

37. $m\angle TUX$ **38.** $m\angle XUV$ **39.** $m\angle TWX$

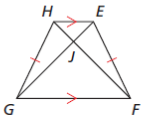


Find each measure.

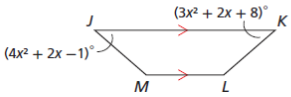
40. $m\angle C$



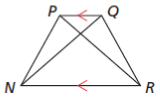
41. HJ, given that $EG = 32.8$ and $FJ = 24.3$



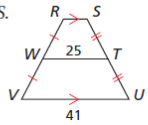
42. Find the value of x so that $JKLM$ is isosceles.



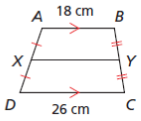
43. Given $RP = 8y - 7$ and $NQ = 10y - 12$, find the value of y so that $NPQR$ is isosceles.



44. Find RS.



45. Find XY.



Answers:

1. hexagon 2. Not a polygon 3. Dodecagon 4. Irregular, concave 5. Irregular, concave
6. regular, convex 7. $m\angle A = 159$, $m\angle B=73$, $m\angle C=111$, $m\angle D=91$, $m\angle E=106$ 8. 900
9. 156 10. 15 11. 30 12. 26 13. 77 14. 103 15, (-2, 1)
16. (-6, 7)
17. ABFG and HDEG are parallelograms, Given
$\angle B\cong\angle G$ and $\angle G\cong\angle D$, opp angles of parallelogram congruent
$\angle B\cong\angle D$, transitive
18. RS=UT=27, so RS is congruent to UT. UR = TS = 11 so UR is congruent to TS. Since both pairs of opp sides are congruent, RSTU is a parallelogram
19. $m\angle W=m\angle Y=86$ and $m\angle X = 94$.
Since 1 $\angle$ is supple to both of it consecutive angles, WXYZ is a parallelogram
20. No 21. Yes, 1 pair of opp sides congruent and parallel 22. Yes, both opp angles congruent
23. Slope of WX = 1 YZ = -1, Slope of WZ = XY = ¼. So both pairs of opp sides have same slope
24. Slopes of AB and CD = 3, AB = CD = $\sqrt{10}$ thus 1 pair both parallel and congruent
25. 122 26. 155 27. 19 28. 35
29. NQ = PR = 6, Slopes of NQ and PR are perpendicular, NQ and PR midpoint at (1, 1) so NQ and PR bisect each other. Diag are perpendicular bisectors.
30. SU = TV = $\sqrt{34}$, slopes are opp reciprocal so perpendicular. Midpoints at (1/2, 5.5) so diag are congruent and perpendicular bisectors of each other.
31. WXYZ is a rect, XB congruent to YZ, given
WX congruent YZ, opp sides congruent
$\angle X$ and $\angle Z$ are rt, defn of rect.
Triangle WXB congruet to triangle YZA, SAS
Segment WB congruent to segment YA, CPCTC

33. Not valid 34. Not valid
35. square, rect, rhombus 36. Rectangle 37. 25 38. 58 39. 25
40. 55 41. 8.5 42. ±3 43. 2.5 44. 9 45. 22 cm