Int. Geometry Unit 7 Test Review

Questions 1-10: Complete each statement with *sometimes*, *always*, or *never*.

- 1. The diagonals of a trapezoid ______ are congruent.
- 2. A rhombus is ______ equiangular.
- 3. A rectangle is ______a square.
- 4. The opposite angles of an isosceles trapezoid are _____ congruent.
- 5. The diagonals of a square are ______ perpendicular bisectors of each other.
- 6. The diagonals of a rhombus ______ bisect each other.
- 7. A rhombus is ______a rectangle.
- 8. The diagonals of a parallelogram ______ bisect the angles of the parallelogram.
- 9. If the diagonals of a quadrilateral are perpendicular, then the quadrilateral is ______a rhombus.
- 10. A quadrilateral with one pair of congruent sides and one pair of parallel sides is ______ a parallelogram.
- <u>Directions 11-20</u>: (a) Give the most accurate name for the quadrilateral
 (b) Write the reason why you may write a phrase or the entire theorem or definition that justifies your answer.
- 11. $\overline{PO} \parallel \overline{MN}$; PO = MN



13. $m \angle PON = m \angle PMN; m \angle OPM = m \angle ONM$ 14. $m \angle 1 = m \angle 5; PN = OM$





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15. $m \angle 1 = m \angle 2 = m \angle 5 = m \angle 6$

$m \angle 7 = m \angle 8 = m \angle 3 = m \angle 4$

17. \overline{ST} \overline{QR} ; ST = QR; $m \angle 1 + m \angle 2 = 90$

8 5 3 1 2 3 4 M N



19.

TQ = QR = RS = ST



Q

- 21. The angles of a pentagon are in the ratio (14:15:14:6:5). What is the measure of the largest angle?
- 22. Find VW and VX given that RSTU is a trapezoid. Segment VW is a median.



R

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23. In isosceles trapezoid *ABCD*, $m \angle A = x^\circ$ and $m \angle B = (2x - 45)^\circ$. Find $m \angle C$ and $m \angle D$ in the following cases:

a) $\overline{AB} \parallel \overline{CD}$ b) $\overline{AD} \parallel \overline{CB}$

- 24. One of the angles of a rhombus is 120° . If the shorter diagonal is 2, what is the length of the longer diagonal?
- 25. Quadrilateral *WXYZ* is a parallelogram. Given that WX = 2x 3, XY = x + 7, and YZ = 3x 8. What is the perimeter of *WXYZ*?
- 26. Trapezoid *ABCD* is divided into four congruent trapezoids as shown. Given AB = 4 and CD = 8, find the sum of all line segments in the figure.



- 27. If the degree measures of the angles of a hexagon are (4x+10), (7x+20), 9x, 100° , 80° and 10x, what is the sum of the smallest angle and the largest angle?
- 28. A diagonal of a rectangle forms a 30° with each of the longer sides of the rectangle. If the length of the shorter side is 3, what is the length of the diagonal?
- 29. If figure *ABCD* is a parallelogram, what is the value of *y*?



30. *PQRS* is a square and *PTS* is an equilateral triangle. What is $m \angle TRS$?



31. A regular pentagon and a regular octagon share a common side. A side of each figure is extended to form a quadrilateral. What is the value of x?



- 32. The measure of each exterior angle of a regular polygon is 20. Name the polygon.
- 33. The measure of each interior angle of a regular polygon is 162. Name the polygon.
- 34. Is it possible for a regular polygon to have an interior angle of 177.5°? If so how many sides does the polygon have?



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- 1. Somtimes 2. Sometimes
- 3. Sometimes 4. Never
- 5. Always 6. Always
- 7. Sometimes 8. Sometimes
- 9. Sometimes 10. Sometimes
- 11. Parallelogram; one pair of congruent and parallel opposite sides
- 12. Kite; one diagonals are perpendicular and only one is bisected
- 13. Parallelogram; opposite angles are congruent
- 14. Isosceles Trapezoid; one pair of parallel sides (AIA theorem) and diagonals are congruent
- 15. Rhombus; parallelogram with diagonals that bisect the angles
- 16. Rectangle; the diagonals bisect each other and diagonals are congruent
- 17. Rectangle; it is a parallelogram (see #11 for reason) with one right angle
- 18. Rhombus; parallelogram (opposite sides are congruent) with perpendicular diagonals
- 19. Rhombus; 4 congruent sides
- 20. Trapezoid; one pair of parallel sides
- 21. 150^o
- 22. VW = 10; VX = 4
- 23. a) $m \angle C = m \angle D = 135^{\circ}$ b) $m \angle C = 105^{\circ}$; $m \angle D = 75^{\circ}$

24.	$2\sqrt{3}$	25.	38
26.	30	27.	248
28.	6	29.	108
30.	75 [°]	31.	126
32.	18-gon	33.	20-gon
34.	Yes, 144-gon		-

Note with the proofs, there are multiple solutions to these problems.

35.

Statement	Reason
1. <i>ABCD</i> is a rectangle	1. Given
2. AC = BD	2. Diagonals of a rect. are congruent
3. <i>ABDE</i> is a parallelogram	3. Given
4. $AE=BD$	4. Opp. sides of a parallelogram are
	congruent
5. $AE = AC$	5. Transitivity
6. ΔEAC is isosceles	6. Definition of Isos. Triangle

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Statement	Reason
1. <i>ABCD</i> is a parallelogram	1. Given
2. $AO = OC$ and $DO = OB$	2. diagonals of a parallelogram bisect each
	other
3. $DE + EO = DO$ and $OF + FB = OB$	3. Segment Addition Post.
4. $DE+EO=OF+FB$	4. substitution
5. $DE = BF$	5. Given
6. $EO = EF$	6. Subtraction PoE
7. <i>O</i> is the midpoint of \overline{EF}	7. Definition of midpoint
8. <i>O</i> is the midpoint of \overline{AC}	8. Definition of a midpoint (see step 2)
9. <i>AFCE</i> is a parallelogram	9. diagonals bisect each other (steps 8 and 9)

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Statement	Reason	
1. <i>ABED</i> is a parallelogram	1. Given	
2. AB = DE	2. opp. sides of a parallelogram are congruent	
3. $\angle C \cong \angle DEC$	3. Given	
4. $DE=DC$	4. Isosceles Triangle Theorem	
5. $AB = DC$	5. Transitivity	
6. $\overline{AD} \parallel \overline{BE}$	6. Definition of a parallelogram (step 1)	
7. <i>ADCB</i> is an isosceles trapezoid	7. Definition of an isos. Trapezoid.	

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Statement	Reason
1. <i>PQRS</i> is a parallelogram	1. Given
2. $PS=QR$ and $\angle P \cong \angle R$	2. opposite sides and angles of a
	paralleogram are congruent
3. $PA=BR$	3. Given
4. $\Delta PAS \cong \Delta RBQ$	4. SAS \cong
5. $AS=QB$	5. Definition of congruent triangles

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39.

Statement	Reason
1. $\overline{RO} \parallel \overline{PV}$ and $\overline{PR} \parallel \overline{VO}$	1. Given
2. <i>PROV</i> is a parallelogram	2. Definition of a parallelogram
3. $\overline{PR} \cong \overline{RO}$	3. Given
4. <i>PROV</i> is a rhombus	4. a parallelogram which has consecutive
	congruent sides is a rhombus
5. $\angle 2 \cong \angle EOV$ or $m \angle 2 = m \angle EOV$	5. In a rhombus the diagonals bisect the
	angles
6. $\overline{RV} \perp \overline{PO}$	6. diagonals of a rhombus are also perp.
7. $\angle OEV$ is a right angle	7. Definition of perpendicular lines
8. ΔEOV is a right triangle	8. Def of a right triangle (one right angle)
9. $\angle 1$ and $\angle EOV$ are complementary	9. the acute angles of a right triangle are
	complementary
10. $m \angle 1 + m \angle EOV = 90$	10. Definition of complementary angles
11. $m \angle 1 + m \angle 2 = 90$	11. Substitution (step 5)
12. $\angle 1$ and $\angle 2$ are complementary	12. Definition of Complementary Angles

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Statement	Reason
1. $\angle 1 \cong \angle 2$	1. Given
2. $\overline{BX} \cong \overline{BZ}$	2. Isosceles Triangle Theorem
3. $\overline{ZY} \cong \overline{BX}$	3. Given
4. $\overline{ZY} \cong \overline{BZ}$	4. Transitivity
5. parallelogram <i>ABZY</i>	5. Given
6. ABZY is a rhombus	6. A parallelogram with two pair of consecutive congruent sides is a rhombus

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Statement	Reason
1. <i>ABZY</i> is a parallelogram	1. Given
2. $BZ = AY$ and $\overline{BZ} \parallel \overline{AY}$	2. opposite sides are parallel and congruent
3. $\angle 2 \cong \angle 3$	3. Corresponding Angle Post
4. $AY = BX$	4. Given
5. $BX=BZ$	5. Transitivity
6. $\angle 1 \cong \angle 2$	6. Isosceles triangle theorem