

6.1 Interior Angles in Convex Polygons

Answers

1.

# of sides	Sum of the Interior Angles	Each angle in a regular n -gon
3	180°	60°
4	360°	90°
5	540°	108°
6	720°	120°
7	900°	128.57°
8	1080°	135°
9	1260°	140°
10	1440°	144°
11	1620°	147.27°
12	1800°	150°

2. 2340° 3. 3780°

4. 26

5. 20

6. 157.5° 7. 165°

8. 15

9. 4

10. 163° 11. 168° 12. 120° 13. 60° 14. $x = 90^\circ, y = 20^\circ$ 15. 35° 16. 115° 17. 105° 18. $x = 51^\circ, y = 108^\circ$ 19. 117.5°

6.2 Exterior Angles in Convex Polygons

Answers

1. 36°
2. 12°
3. 360°
4. $x = 72.5^\circ, y = 107.5^\circ$
5. $x = 90^\circ, y = 64^\circ$
6. 36°
7. 45°
8. 40°
9. 120°
10. 72°

6.3 Parallelograms

Answers

1. $CD = 6$
2. $AC = 8$
3. 100°
4. 45°
5. 62°
6. $DE = 8$
7. $m\angle D = 72^\circ, m\angle A = m\angle C = 108^\circ$
8. $m\angle Q = 143^\circ, m\angle P = m\angle D = 37^\circ$
9. All the angles are 90° .
10. $m\angle H = x^\circ, m\angle E = m\angle G = (180 - x)^\circ$.
11. $c = 6$
12. $d = 10, e = 14$
13. $f = 5, g = 3$
14. $h = 25^\circ, j = 11^\circ, k = 8^\circ$
15. $m = 25^\circ, n = 19^\circ$
16. $p = 8, q = 3$
17. $r = 1, s = 2$
18. $t = 3, u = 4$
19. 96°
20. 85°
21. 43°
22. 42°
23. Yes

- 24. No
- 25. No
- 26. Yes

27.

Statement	Reason
1. $ABCD$ is a parallelogram with diagonal \overline{BD}	Given
2. $\overline{AB} \parallel \overline{DC}$, $\overline{AD} \parallel \overline{BC}$	Definition of a parallelogram
3. $\angle ABD \cong \angle BDC$, $\angle ADB \cong \angle DBC$	Alternate Interior Angles Theorem
4. $\overline{DB} \cong \overline{DB}$	Reflexive PoC
5. $\triangle ABD \cong \triangle CDB$	ASA
6. $\angle A \cong \angle C$	CPCTC

28.

Statement	Reason
1. $ABCD$ is a parallelogram with diagonals \overline{BD} and \overline{AC}	Given
2. $\overline{AB} \parallel \overline{DC}$, $\overline{AD} \parallel \overline{BC}$	Definition of a parallelogram
3. $\angle ABD \cong \angle BDC$, $\angle CAB \cong \angle ACD$	Alternate Interior Angles Theorem
4. $\overline{AB} \cong \overline{DC}$	Opposite Sides Theorem
5. $\triangle DEC \cong \triangle BEA$	ASA
6. $\overline{AE} \cong \overline{EC}$, $\overline{DE} \cong \overline{EB}$	CPCTC

- 29. $x = 16$, $y = 105^\circ$, $z = 60^\circ$

6.4 Quadrilaterals that are Parallelograms

Answers

1. No; $6 \neq 5$
2. Yes, Opposite Sides Converse
3. Yes, Opposite Angles Converse
4. Yes, Parallelogram Diagonals Converse
5. No; $7.1 \neq 7.2$
6. No; $75^\circ \neq 80^\circ$
7. Yes, Definition of a Parallelogram
8. No; $11 \neq 10$
9. Yes, Opposite Sides Converse
10. Yes, Opposite Angles Converse
11. No; this could be a trapezoid, we do not know anything about two of the angles.
12. No; this could be an isosceles trapezoid because consecutive angles are congruent.
13. $x = 19$
14. $x = 65^\circ$, $y = 115^\circ$
15. $x = 23$, $y = 15$
16. $x = 5$
17. $x = 8^\circ$, $y = 10^\circ$
18. $x = 4$, $y = 3$
19. Yes
20. Yes
21. No
22. Yes

23.

Statement	Reason
1. $\angle A \cong \angle C, \angle D \cong \angle B$	Given
2. $m\angle A = m\angle C, m\angle D = m\angle B$	\cong angles have = measures
3. $m\angle A + m\angle B + m\angle C + m\angle D = 360^\circ$	Definition of a quadrilateral
4. $m\angle A + m\angle A + m\angle B + m\angle B = 360^\circ$	Substitution PoE
5. $2m\angle A + 2m\angle B = 360^\circ$ $2m\angle A + 2m\angle D = 360^\circ$	Combine Like Terms
6. $m\angle A + m\angle B = 180^\circ$ $m\angle A + m\angle D = 180^\circ$	Division PoE
7. $\angle A$ and $\angle B$ are supplementary $\angle A$ and $\angle D$ are supplementary	Definition of Supplementary Angles
8. $\overline{AD} \parallel \overline{BC}, \overline{AB} \parallel \overline{DC}$	Consecutive Interior Angles Converse
9. $ABCD$ is a parallelogram	Definition of a Parallelogram

24.

Statement	Reason
1. $\overline{AE} \cong \overline{EC}, \overline{DE} \cong \overline{EB}$	Given
2. $\angle AED \cong \angle BEC$ $\angle DEC \cong \angle AEB$	Vertical Angles Theorem
3. $\triangle AED \cong \triangle CEB$ $\triangle AEB \cong \triangle CED$	SAS
4. $\overline{AB} \cong \overline{DC}, \overline{AD} \cong \overline{BC}$	CPCTC
5. $ABCD$ is a parallelogram	Opposite Sides Converse

25.

Statement	Reason
1. $\angle ADB \cong \angle CBD, \overline{AD} \cong \overline{BC}$	Given
2. $\overline{AD} \parallel \overline{BC}$	Alternate Interior Angles Converse
3. $ABCD$ is a parallelogram	Parallel Congruent Sides Theorem

6.5 Parallelogram Classification

Answers

1.
 - a) $RG = 13$
 - b) $AE = 26$
 - c) $AC = 24$
 - d) $EC = 10$
 - e) 90°

2.
 - a) $MA = 12$
 - b) $MI = 21.4$
 - c) $DA = 11$
 - d) 54°
 - e) 90°

3.
 - a) 90°
 - b) 90°
 - c) 45°
 - d) 45°

4. Rhombus
5. Parallelogram
6. Rectangle
7. Rectangle
8. Rhombus
9. None

10. Parallelogram
11. Square
12. Rectangle
13. None
14. Square
15. Parallelogram
16. Sometimes, a rectangle is a rhombus when it is a square.
17. Always; a square is a more specific type of parallelogram.
18. Sometimes, a parallelogram is regular (sides and angles equal) when it is a square.
19. Always; a square is a more specific type of rectangle.

6.6 Trapezoids

Answers

1. No, if the parallel sides were congruent, then it would be a parallelogram. By the definition of a trapezoid, it can never be a parallelogram (exactly one pair of parallel sides).
2. 33
3. 28
4. 8
5. 11
6. 37
7. 5
8. $x = 4$
9. No
10. Yes

6.7 Kites

Answers

1. $x = 114^\circ, y = 44^\circ$
2. $x = y = 102.5^\circ$
3. $x = 10, y = 6$
4. $x = 5, y = 12$
5. $x = 8, y = 17$
6. $x \approx 11.4, y = 41$
7. $x = 5, y \approx 8.54$
8. $x = 11, y = 17$
9. $y = 5^\circ$
10. $y = 45^\circ$
11. $x = 12, y = 8^\circ$

12.

Statement	Reason
1. $\overline{KE} \cong \overline{TE}$ and $\overline{KI} \cong \overline{TI}$	Given
2. $\overline{EI} \cong \overline{EI}$	Reflexive PoC
3. $\triangle EKI \cong \triangle ETI$	SSS
4. $\angle KES \cong \angle TES$ and $\angle KIS \cong \angle TIS$	CPCTC
5. \overline{EI} is the angle bisector of $\angle KET$ and $\angle KIT$	Definition of an angle bisector

13.

Statement	Reason
1. $\overline{KE} \cong \overline{TE}$ and $\overline{KI} \cong \overline{TI}$	Given
2. $\triangle KET$ and $\triangle KIT$ are isosceles triangles	Definition of isosceles triangles
3. \overline{EI} is the angle bisector of $\angle KET$ and $\angle KIT$	Theorem 6-22
4. \overline{EI} is the perpendicular bisector of \overline{KT}	Isosceles Triangle Theorem
5. $\overline{KT} \perp \overline{EI}$	Definition of perpendicular lines.

6.8 Quadrilateral Classification

Answers

1. Square
2. Rhombus
3. Rectangle
4. Parallelogram
5. Rectangle
6. Square
7. Parallelogram
8. Rectangle
9. $CE = 8$
10. $SC = 14.42, RC = 16.97$
11. Parallelogram
12. Square
13. Kite
14. Trapezoid