PRYZ is a rhombus. If RK = 5, RY = 13 and $m \angle YRZ = 67$, find each measure.

ALGEBRA Find the value of each variable in the given parallelogram. (2 points each)



F y+3

1. KY

3.



5. **CONSTRUCTION** Mr. Rodriguez used the parallelogram at the right to design a herringbone pattern for a paving stone. He will use the paving stone for a sidewalk. If $m \angle 1$ is 130, find $m \angle 2$, $m \angle 3$, and $m \angle 4$.



Quadrilateral *GHJK* is a rectangle and $m \angle 1 = 37$.



- 6. Which angles in the diagram are congruent to ∠
 1? Choose all that apply.
- 7. Which angles in the diagram are congruent to ∠
 2? Choose all that apply.

Determine whether each quadrilateral is a parallelogram. Justify your answer.



MNPQ is a rhombus. If $PQ = 3\sqrt{2}$ and AP = 3, find each measure.



9. *m∠MNP*

10. In rhombus XYZA, if XY=8, find ZA.



11. In rhombus *DEFG*, if $m \angle DEG = 19$, find $m \angle EFD$.



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Determine whether the quadrilateral is a parallelogram. Justify your answer. (2 points each) 12.



- 13. The diagonals of square *ABCD* intersect at *E*. If *AE* = 3x - 4 and *BD* = 10x - 48, find *AC*. a. 90 b. 52 c. 26 d. 10
- 14. Find the value of *x* so that this quadrilateral is a parallelogram.



- 15. Judith built a fence to surround her property. On a coordinate plane, the four corners of the fence are loc at (-16, 1), (-6, 5), (4, 1),and (-6, -3). Which of the following most accurately describes the shape of Judi fence?
 - a. square b. rectangle c. rhombus d. trapeze

- 16. The diagonals of square *ABCD* intersect at *E*. If *AE* = 2x + 6 and BD = 6x - 10, find *AC*. a. 11 b. 28 c. 56 d. 90
- 17. Find the values of *x* and *y* so that the quadrilateral is a parallelogram.



- 18. Find $m \angle W$ in parallelogram *RSTW*, if $m \angle W = 2x-1$ and $m \angle S = x+16$
 - a. 17 b. 33 c. 55 d. 125
- 19. For parallelogram *JKMH*, find $m \angle JHK$, $m \angle HMK$, and the **value of** x. _____,



•

20. Determine whether this quadrilateral is a parallelogram. Justify your answer.



21. If $m \angle BEC = 9z + 45$ in rhombus *ABCD*, find the value of *z*.



23. The diagonals of square *ABCD* intersect at *E*. If AE = 2, find the perimeter of *ABCD*.

Write true or false.

- 24. A parallelogram always has four right angles.
- 25. Find *x*.



- 26. Determine whether *ABCD* is a parallelogram if AB = 6, BC = 12, CD = 6, and DA = 12. Justify your answer.
- 27. The slope of \overline{AB} and \overline{CD} is $\frac{3}{5}$ and the slope of \overline{BC} and \overline{AD} is $-\frac{5}{3}$. The best name for ABCD, using the given information, is a _____.

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COORDINATE GEOMETRY Graph each
quadrilateral with the given vertices.
Determine whether the figure is a
parallelogram. Justify your answer with the
method indicated.
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- 28. *R*(-2, 5), *O*(1, 3), *M*(-3, -4), *Y*(-6, -2); Distance and Slope Formulas
- 29. Determine whether the figure with the given vertices is a parallelogram. Use the method indicated.
 A(-7, -4), B(5, -4), C(7, 6), D(-5, 6); Slope Formula
- 30. **PROOF** Write a paragraph proof of the following.



Given: $\square PRST$ and $\square PQVU$ Prove: $\angle V \cong \angle S$

31. Write a two-column proof to show that opposite angles of a parallelogram are congruent:



Name:

32. Write a two-column proof to show that consecutive angles of a parallelogram are supplementary:





Refer to parallelogram ABCD to answer to following questions.



33. Do the diagonals bisect each other? Justify your answer and show all necessary work.

Answer	Kev
1115 11 01	IXCY

1.12

- 2.90
- 3. x = 18, y = 9
- 4. x = 30, y = 50
- 5. 50, 130, 50
- 6. ∠4
- 7.∠5
- 8. No; none of the tests for parallelograms are fulfilled.

9.90

10.8

11.71

12. Yes; A pair of opposite sides is both parallel and congruent.

13. b

14. c

15. c

- 16. c
- 17. a

18. b

19. $m \angle JHK = 52$; $m \angle HMK = 108$ and x = 8.

20. No; none of the tests for \square s are fulfilled.

21.5

22. (-1, 10)

23.8√2

- 24. false
- 25.50

26. Yes; opposite sides are congruent to each other.

27. Rectangle

28. Yes; see students' work.

29. Yes

30. **Proof:** We are given $\square PRST$ and $\square PQVU$. Since opposite angles of a parallelogram are congruent, $\angle P \cong \angle V$ and $\angle P \cong \angle S$. Since congruence of angles is transitive, $\angle V \cong \angle S$ the Transitive Property of Congruence.

31. 1. GKLM is a parallelogram (given)
2. GK || LM, GM || KL (def of a parallelogram)
3. ∠G & ∠K are supplementary (consecutive interior angle theorem) ∠K & ∠L are supplementary ∠L & ∠M are supplementary
4. ∠G ≅ ∠L (Angles supplementary to the same angle are congruent) ∠K ≅ ∠M
32.
1. GKLM is a parallelogram (given)

2. *GK* || *LM*; *KL* || *GM*(def of a parallelogram)

3. $\angle G \& \angle K \text{ are supplementary}$ (consecutive interior angle theorem)

33. Yes; $\overline{AK} \cong \overline{CK}$ and $\overline{DK} \cong \overline{BK}$