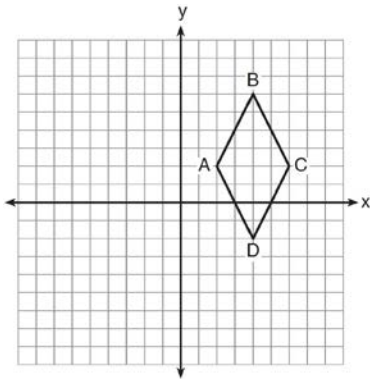


G.GPE.B.4: Quadrilaterals in the Coordinate Plane 1a

- 1 Quadrilateral $ABCD$ is graphed on the set of axes below.



Which quadrilateral best classifies $ABCD$?

- 1) trapezoid
 - 2) rectangle
 - 3) rhombus
 - 4) square
- 2 A quadrilateral has vertices with coordinates $(-3, 1)$, $(0, 3)$, $(5, 2)$, and $(-1, -2)$. Which type of quadrilateral is this?
- 1) rhombus
 - 2) rectangle
 - 3) square
 - 4) trapezoid
- 3 Parallelogram $ABCD$ has coordinates $A(1, 5)$, $B(6, 3)$, $C(3, -1)$, and $D(-2, 1)$. What are the coordinates of E , the intersection of diagonals \overline{AC} and \overline{BD} ?
- 1) $(2, 2)$
 - 2) $(4.5, 1)$
 - 3) $(3.5, 2)$
 - 4) $(-1, 3)$
- 4 Rectangle $KLMN$ has vertices $K(0, 4)$, $L(4, 2)$, $M(1, -4)$, and $N(-3, -2)$. Determine and state the coordinates of the point of intersection of the diagonals.

- 5 The diagonals of rhombus $TEAM$ intersect at $P(2, 1)$. If the equation of the line that contains diagonal \overline{TA} is $y = -x + 3$, what is the equation of a line that contains diagonal \overline{EM} ?
- 1) $y = x - 1$
 - 2) $y = x - 3$
 - 3) $y = -x - 1$
 - 4) $y = -x - 3$
- 6 The coordinates of the vertices of parallelogram $ABCD$ are $A(-3, 2)$, $B(-2, -1)$, $C(4, 1)$, and $D(3, 4)$. The slopes of which line segments could be calculated to show that $ABCD$ is a rectangle?
- 1) \overline{AB} and \overline{DC}
 - 2) \overline{AB} and \overline{BC}
 - 3) \overline{AD} and \overline{BC}
 - 4) \overline{AC} and \overline{BD}
- 7 Parallelogram $ABCD$ has coordinates $A(0, 7)$ and $C(2, 1)$. Which statement would prove that $ABCD$ is a rhombus?
- 1) The midpoint of \overline{AC} is $(1, 4)$.
 - 2) The length of \overline{BD} is $\sqrt{40}$.
 - 3) The slope of \overline{BD} is $\frac{1}{3}$.
 - 4) The slope of \overline{AB} is $\frac{1}{3}$.
- 8 The coordinates of two vertices of square $ABCD$ are $A(2, 1)$ and $B(4, 4)$. Determine the slope of side \overline{BC} .
- 9 The coordinates of quadrilateral $PRAT$ are $P(a, b)$, $R(a, b + 3)$, $A(a + 3, b + 4)$, and $T(a + 6, b + 2)$. Prove that \overline{RA} is parallel to \overline{PT} .

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Answer Section

1 ANS: 3

Both pairs of opposite sides are parallel, so not a trapezoid. None of the angles are right angles, so not a rectangle or square. All sides are congruent, so a rhombus.

REF: 081411ge

2 ANS: 4

$$\frac{-2-1}{-1-3} = \frac{-3}{2} \quad \frac{3-2}{0-5} = \frac{1}{-5} \quad \frac{3-1}{0-3} = \frac{2}{3} \quad \frac{2-2}{5-1} = \frac{4}{6} = \frac{2}{3}$$

REF: 081522geo

3 ANS: 1

The diagonals of a parallelogram intersect at their midpoints. $M_{AC} \left(\frac{1+3}{2}, \frac{5+(-1)}{2} \right) = (2,2)$

REF: 061209ge

4 ANS:

$$\left(\frac{0+1}{2}, \frac{4+4}{2} \right)$$

$$\left(\frac{1}{2}, 0 \right)$$

REF: 081534ge

5 ANS: 1

$$m_{TA} = -1 \quad y = mx + b$$

$$m_{EM} = 1 \quad 1 = 1(2) + b$$

$$-1 = b$$

REF: 081614geo

6 ANS: 2

Adjacent sides of a rectangle are perpendicular and have opposite and reciprocal slopes.

REF: 061028ge

7 ANS: 3

$$\frac{7-1}{0-2} = \frac{6}{-2} = -3 \quad \text{The diagonals of a rhombus are perpendicular.}$$

REF: 011719geo

8 ANS:

$$m_{AB} = \frac{4-1}{4-2} = \frac{3}{2} \quad m_{BC} = -\frac{2}{3}$$

REF: 061334ge

9 ANS:

$m_{\overline{RA}} = \frac{(b+3) - (b+4)}{a - (a+3)} = \frac{-1}{-3} = \frac{1}{3}$. Because \overline{RA} and \overline{PT} have equal slopes, they are parallel.

$$m_{\overline{PT}} = \frac{b - (b+2)}{a - (a+6)} = \frac{-2}{-6} = \frac{1}{3}$$

REF: 060824b