

Geometry · Parallelograms and Special Quadrilaterals · Test

Common Core G-CO.C.11 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

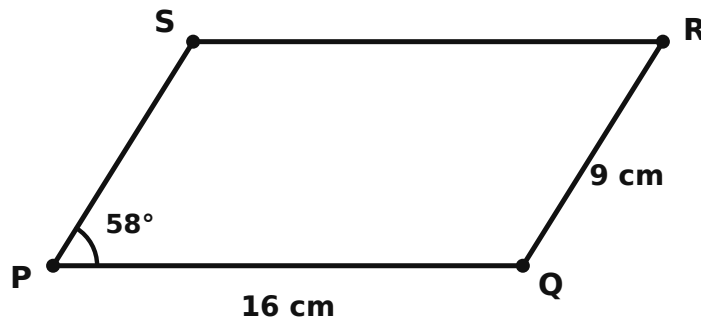
This test has 9 questions worth 20 points in total. It covers parallelogram properties, proving a quadrilateral is a parallelogram, and the special quadrilaterals. Show your work and give a reason for each step. A calculator is not needed, and the figures are not drawn to scale unless a measurement is given. You have 45 minutes.

Test information

- **Grade:** Geometry
- **Chapter:** Parallelograms and Special Quadrilaterals
- **Common Core:** G-CO.C.11
- **Time:** 45 minutes
- **Total:** 20 points (Question 1: 2 pts; Question 2: 2 pts; Question 3: 2 pts; Question 4: 3 pts; Question 5: 2 pts; Question 6: 2 pts; Question 7: 2 pts; Question 8: 2 pts; Question 9: 3 pts)

Question 1: Properties of a parallelogram (2 points)

In parallelogram $PQRS$, $PQ = 16$ cm, $QR = 9$ cm and $m\angle P = 58^\circ$.



Parallelogram PQRS with $PQ = 16$ cm, $QR = 9$ cm and angle $P = 58$ degrees.

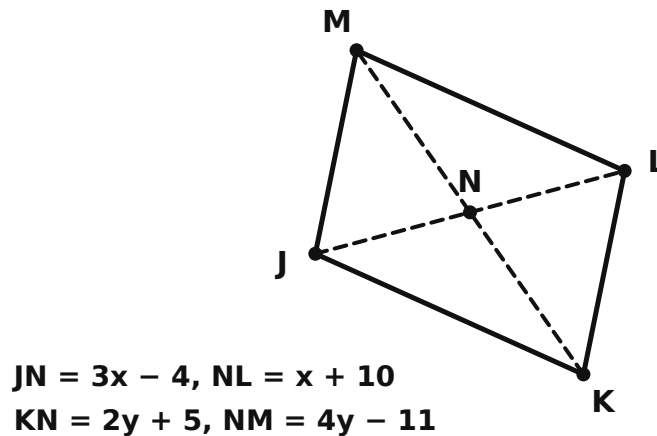
- Find RS and SP . (1 point)
- Find $m\angle Q$, $m\angle R$ and $m\angle S$. (1 point)

Question 2: Angles with a variable (2 points)

In parallelogram $WXYZ$, $m\angle W = (5x - 15)^\circ$ and $m\angle X = (3x + 35)^\circ$. Find x (1 point), then find $m\angle Y$ and $m\angle Z$ (1 point).

Question 3: Diagonals with two variables (2 points)

The diagonals of parallelogram $JKLM$ meet at N . Use the labels in the figure to find JL and KM . (1 point each)



Parallelogram $JKLM$ with diagonals meeting at N and the segment expressions listed in the figure.

Question 4: Parallelogram or not? (3 points)

Decide whether each quadrilateral must be a parallelogram. Justify each answer. (1 point each)

- In quadrilateral $ABCD$, $\overline{AB}$ is parallel to $\overline{DC}$ and $AB = DC$.
- In quadrilateral $EFGH$, $m\angle E = m\angle G$ and $m\angle F = m\angle H$.
- In quadrilateral $PQRS$, $PQ = PS$, $RQ = RS$, and the diagonals are perpendicular.

Question 5: Diagonals of a rectangle (2 points)

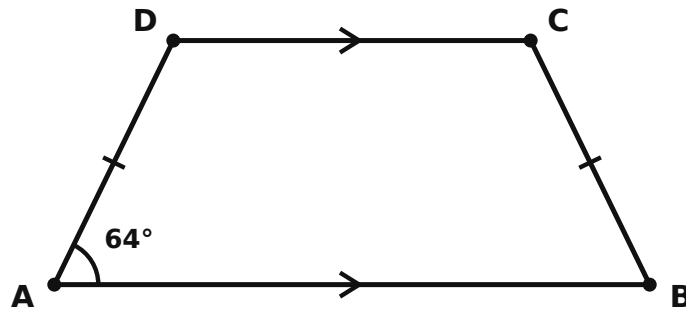
Rectangle $RSTU$ has diagonals $RT = 6x + 4$ and $SU = 4x + 18$. Find x (1 point) and RT (1 point).

Question 6: Angles of a rhombus (2 points)

In rhombus $ABCD$, $m\angle ABC = 76^\circ$. Find $m\angle BAD$ (1 point) and $m\angle BAC$ (1 point).

Question 7: Isosceles trapezoid (2 points)

In isosceles trapezoid $ABCD$ with bases $\overline{AB}$ and $\overline{DC}$, $m\angle A = 64^\circ$.



Isosceles trapezoid ABCD with bases AB and DC and angle A = 64 degrees.

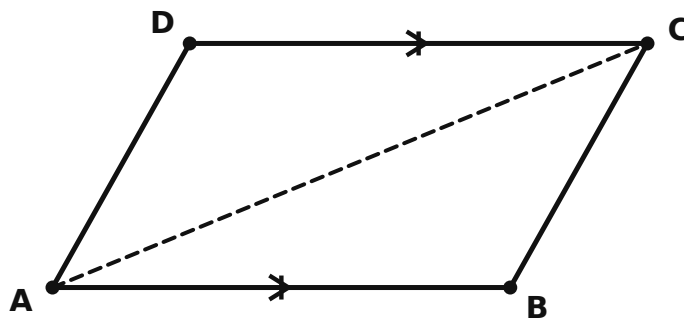
- Find $m\angle B$, $m\angle C$ and $m\angle D$. (1 point)
- The diagonals are $AC = 4x + 1$ and $BD = 6x - 11$. Find AC . (1 point)

Question 8: Kite (2 points)

Kite $KLMN$ has $KL = KN$ and $ML = MN$. Also $m\angle K = 88^\circ$ and $m\angle M = 48^\circ$. Find $m\angle L$ (1 point). The diagonals meet at P . Find $m\angle KPL$ (1 point).

Question 9: Two-column proof (3 points)

Given: In quadrilateral $ABCD$, $\overline{AB}$ is parallel to $\overline{DC}$ and $AB = DC$. Prove: $ABCD$ is a parallelogram. Write a two-column proof. You may draw diagonal $\overline{AC}$.



Quadrilateral ABCD with AB parallel and equal to DC, and diagonal AC drawn.