

Quadrilateral Properties: Parallelograms to Kites

Grade 10 – Geometry math · Test · Standards: G-CO.C.11

Name: _____ Date: _____ Class: _____

Eight questions, 20 points, 45 minutes. Show your work and name each property you use.
Figures are not drawn to scale.

Standards: G-CO.C.11 · **Level:** Grade 10 Geometry

Time: 45 minutes · 8 questions · Total: 20 points · Calculator: as allowed by your teacher

Question 1 Parallelogram sides (2 points)

In parallelogram $PQRS$, $PQ = 7x - 9$ and $SR = 4x + 12$. Find x (1 point) and PQ (1 point).

Question 2 Parallelogram angles (3 points)

In parallelogram $PQRS$, $m\angle P = (5x + 8)^\circ$ and $m\angle Q = (7x + 16)^\circ$.

- Find x . (1 point)
- Find $m\angle P$ and $m\angle Q$. (1 point)
- Find $m\angle R$ and $m\angle S$. (1 point)

Question 3 Diagonal pieces (2 points)

The diagonals of parallelogram $ABCD$ meet at E . $AE = 2x + 5$ and $EC = 4x - 11$. Find x and the length of AC .

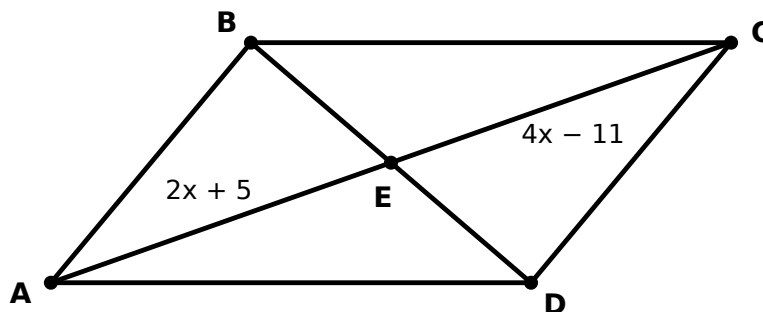


Figure for Question 3.

Question 4 Test for a parallelogram (3 points)

Decide whether each quadrilateral must be a parallelogram. Answer yes or no and give a reason.

- The diagonals bisect each other. (1 point)
- One pair of opposite sides is parallel and the other pair is congruent. (1 point)
- Both pairs of opposite angles are congruent. (1 point)

Question 5 Rhombus measures (3 points)

Rhombus $ABCD$ has side length 17. Diagonal AC is 16 units long and the diagonals meet at E .

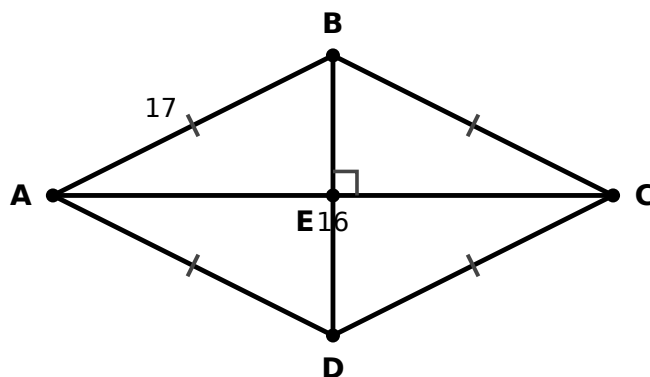


Figure for Question 5.

- Find BE . (1 point)
- Find the length of diagonal BD . (1 point)
- Find the area of the rhombus. (1 point)

Question 6 Prove diagonals give a parallelogram (3 points)

Given: In quadrilateral $ABCD$, the diagonals meet at E , with $AE \cong CE$ and $BE \cong DE$. Prove: $AB \cong CD$ and $AB \parallel CD$.

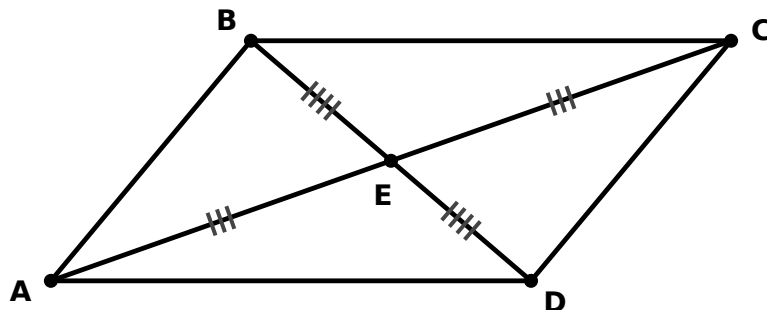


Figure for Question 6.

Question 7 Trapezoids (2 points)

A trapezoid has bases of 14 and 26. (1 point) Find its midsegment. If the trapezoid is isosceles with a base angle of 65° , find the measure of the angle next to it along a leg. (1 point)

Question 8 Kite angles (2 points)

Kite $ABCD$ has $AB = AD$ and $CB = CD$. $m\angle B = 112^\circ$ and $m\angle A = 76^\circ$. Find $m\angle D$ (1 point) and $m\angle C$ (1 point).