

New Concepts

Problem Set #30

*“In mathematics the art of proposing a question must be held of higher value than solving it.”*

- Georg Cantor

New Postulates and Theorems

Theorem 45 – The diagonals of a rectangle are congruent.

Theorem 46 – The diagonals of a rhombus are perpendicular.

Theorem 47 – Each diagonal of a rhombus bisects two angles of the rhombus.

Theorem 48 – The midpoint of the hypotenuse of a right triangle is equidistant from the three vertices.

Theorem 49 – If an angle in a parallelogram is a right angle, then the parallelogram is a rectangle.

Theorem 50 – If two consecutive sides of a parallelogram are congruent, then the parallelogram is a rhombus.

Theorem 51 – Base angles of an isosceles trapezoid are congruent.

Theorem 52 – The median of a trapezoid:

(a) is parallel to the bases;

(b) has the length equal to the average of the base lengths.

Exercises:

p.187 #11,15,19,21,27-33odd, p.192 #5,9,13,16,17,19

Problems:

30-1 Midpoints of a trapezoid

Using a compass and straightedge, construct a large isosceles trapezoid.

Construct the midpoints of each side of the trapezoid.

Connect the midpoint in order to form a convex quadrilateral.

What can you prove to be true about this new, smaller quadrilateral? (What kind of special quadrilateral must it be?)