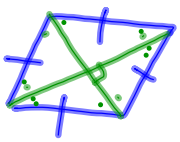
8-5 Rhombi and Squares

Rhombus (Plural is Rhombi)



*A quadrilateral with four congruent sides.
*A Special parallelogram (both pairs of opposite sides are congruent
*Properties of parallelograms apply (8-2 & 8-3)
**Opposite sides are parallel.
**Opposite angles are congruent.
**Consecutive angles are supplementary.
**Diagonals bisect each other.
**Each diagonal of a parallelogram separates the parallelogram into two congruent triangles.

Other properties for a rhombus:
*Diagonals are perpendicular.
*Diagonals bisect both pairs of opposite angles.

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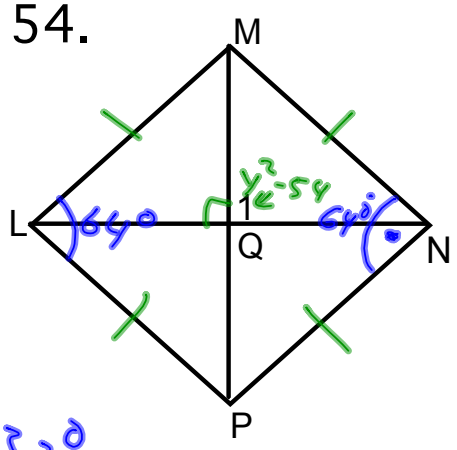
Square:
*A quadrilateral that is both a rectangle (four right angles) and a rhombus (four congruent sides).
*Properties of parallelograms apply (8-2 & 8-3)
**Opposite sides are parallel.
**Opposite angles are congruent.
**Consecutive angles are supplementary.
**Diagonals bisect each other.
**Each diagonal of a parallelogram separates the parallelogram into two congruent triangles.

***Properties of Rectangles Apply (8-4)**
**Diagonals are congruent.
***Properties of Rhombi Apply (8-5)**
**Diagonals are perpendicular.
**Diagonals bisect both pair of opposite angles.

1. Use rhombus LMNP and the given information to find each value.

a. Find y if $m\angle 1 = y^2 - 54$.

$y^2 - 54 = 90$
$+54 \quad +54$
$y^2 = 144$
$y = \pm 12$



b. Find $m\angle PNL$ if $m\angle MLP = 64°$.

$\frac{64}{2} = 32°$

$m\angle PNL = 32°$

2. Determine whether parallelogram ABCD is a rhombus, a rectangle, or a square for A (-2, -1), B(-1, 3), C (3, 2), and D (2, -2). List all that apply.

$d = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$

$BD = \sqrt{(2-(-1))^2+(-2-3)^2}$
$BD = \sqrt{(3)^2+(-5)^2}$
$BD = \sqrt{9+25} = \sqrt{34}$
$AC = \sqrt{(3-(-2))^2+(2-(-1))^2}$
$AC = \sqrt{25+9} = \sqrt{34}$

Rectangle
rhombus
Square