March 20

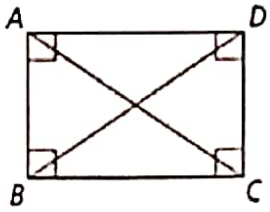
GUIDED NOTES: Properties of Rectangles, Rhombus, and Squares

Rectangle

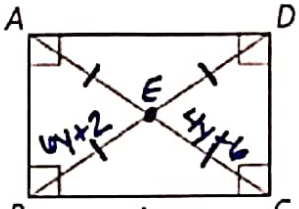
A **rectangle** is a parallelogram with four right angles.

A **rectangle** has all the properties of a parallelogram PLUS:

- 4 right angles
- Diagonals are congruent – all 4 parts are congruent



EX1: □ABCD is a rectangle whose diagonals intersect at point E. If BE = 6y + 2 and CE = 4y + 6, find y.



$6y+2 = 4y+6$

$-6 \quad -6$

$6y - 4 = 4y$

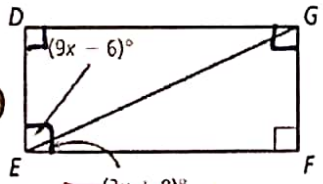
$-6y \quad -6y$

$-4 = -2y$

$-2 \quad -2$

$2 = y$

EX2: Solve for x if □DGFE is a rectangle.



$9x - 6 + 2x + 8 = 90$

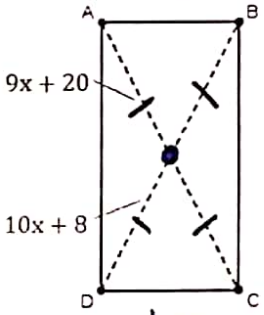
$11x + 2 = 90$

$-2 \quad -2$

$\frac{11x}{11} = \frac{88}{11}$

$x = 8$

EX3: Find the value of x given rectangle *ABCD* below.



$10x + 8 = 9x + 20$

$-9x \quad -9x$

$x + 8 = 20$

$-8 \quad -8$

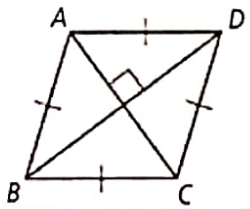
$x = 12$

Rhombus

A **rhombus** is a parallelogram with four congruent sides.

A **rhombus** has all the properties of a parallelogram PLUS:

- 4 congruent sides
- Diagonals bisect angles
- Diagonals are perpendicular – make right angles



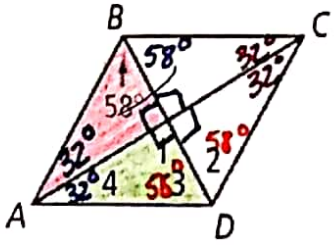
EX4: If □ABCD is a rhombus, find m∠1, m∠2, m∠3, and m∠4.

$\angle 1 = 90°$

$\angle 2 = 58°$

$\angle 3 = 58°$

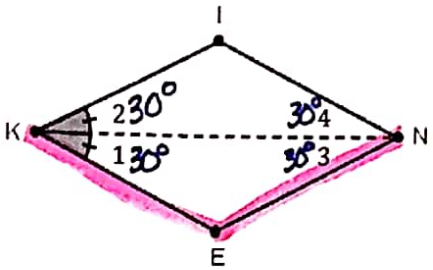
$\angle 4 = 32°$



$180 - 58 - 90 = 32°$

$180 - 90 - 32 = 58°$

EX5: If The following figure is a rhombus, and m∠2 is 30°, what is the m∠E?



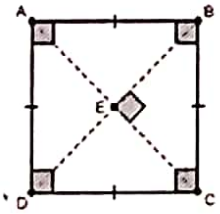
$180 - 30 - 30 = 120° = \angle E$

Square

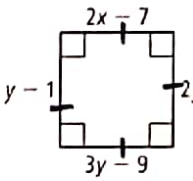
A **square** is a parallelogram with four congruent sides and four right angles.

A **square** has all the properties of a parallelogram PLUS:

- All the properties of a rectangle
- All the properties of a rhombus



EX6: Solve for each variable if the figure is a square.



$y - 1 = 2y - 5$

$-2y \quad +2y$

$-1y - 1 = -5$

$+1 \quad +1$

$\frac{-1y}{-1} = \frac{-4}{-1}$

$y = 4$

$2x - 7 = y - 1$

$2x - 7 = 4 - 1$

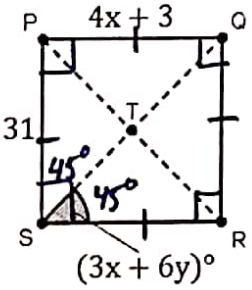
$2x - 7 = 3$

$+7 \quad +7$

$\frac{2x}{2} = \frac{10}{2}$

$x = 5$

EX7: What must the value of y be in order for rhombus *PQRS* to be a square?



$4x + 3 = 31$

$-3 \quad -3$

$\frac{4x}{4} = \frac{28}{4}$

$x = 7$

$3x + 6y = 45$

$3(7) + 6y = 45$

$21 + 6y = 45$

$-21 \quad -21$

$\frac{6y}{6} = \frac{24}{6}$

$y = 4$