

key

SQUARE NOTES

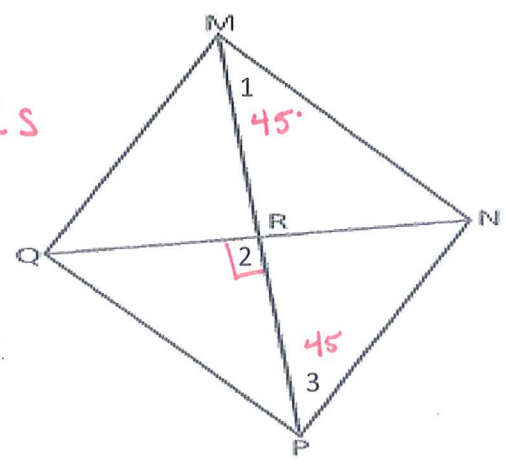
- Opposite sides of a parallelogram are parallel and \cong
- Opposite angles of a parallelogram are \cong
- Consecutive angles of a parallelogram are Suppl.
- The sum of the angles of a parallelogram are = 360°
- The diagonals of a parallelogram bisect each other
- Diagonals are perpendicular to each other
- Diagonals bisect the angles
- **Diagonals are CONGRUENT**

1.) **Example:** MNPQ is a square. Find the measure of each angle and justify why you can conclude this.

$m\angle 1 = 45^\circ$ because: diags bisect the \angle s

$m\angle 2 = 90^\circ$ because: diags are \perp

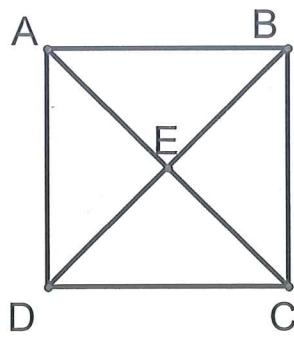
$m\angle 3 = 45^\circ$ because: diags bisect the angles.



Use **Square ABCD** to solve each problem.

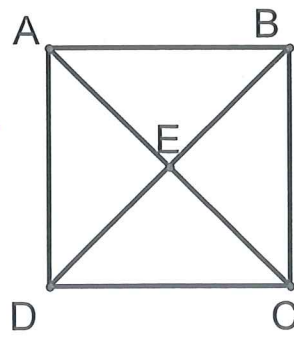
2. $m\angle AEB = 3x$. Find x .

$\angle AEB = 90^\circ$ diags are \perp
 $3x = 90^\circ$
 $x = 30^\circ$

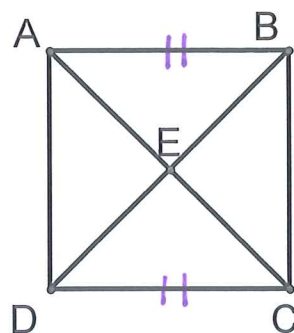


3. $m\angle BAC = 9x$. Find x .

$\angle BAC = 45^\circ$ diags bisect the right \angle s
 $\frac{9x}{9} = \frac{45}{9}$
 $x = 5$



4. $AB = 2x + 4$ and $CD = 3x - 5$. Find BC .



$$AB = CD$$

$$2x + 4 = 3x - 5$$

$$4 = x - 5$$

$$\begin{array}{r} +5 \\ +5 \end{array}$$

$$\boxed{9 = x}$$

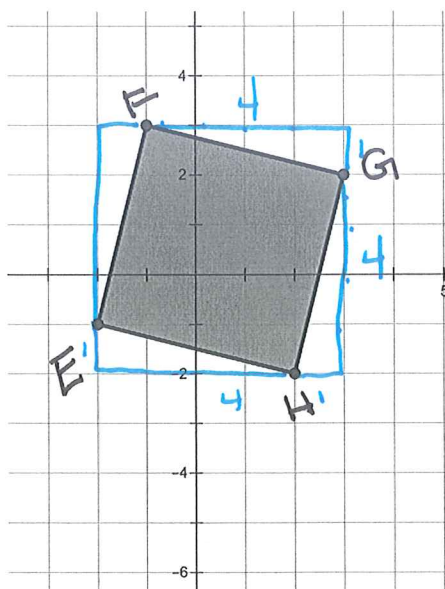
def of a square
all 4 sides \cong
and 4 right \angle s

$$BC = 2(9) + 4$$

$$\boxed{BC = 22}$$

5. Determine whether the figure with vertices $E(-2, -1)$, $F(-1, 3)$, $G(3, 2)$, and $H(2, -2)$ is a square.

To be a square, you must test for 4 \cong sides and 4 Right \angle s



Distance for
 \cong sides

$$1^2 + 4^2 = FG^2$$

$$\boxed{\sqrt{17} = FG}$$

$$1^2 + 4^2 = FG^2$$

$$\boxed{\sqrt{17} = FG}$$

$$1^2 + 4^2 = EH^2$$

$$\boxed{\sqrt{17} = EH}$$

$$1^2 + 4^2 = EF^2$$

$$\boxed{\sqrt{17} = EF}$$

Slopes for \perp

$$\text{Slope } EF = 4$$

$$\text{Slope } FG = -\frac{1}{4} \quad \perp$$

$$\text{Slope } HG = 4 \quad \perp$$

$$\text{Slope } EH = -\frac{1}{4} \quad \perp$$

consecutive sides
are \perp

all 4 sides
are \cong \rightarrow

must conclude: all 4 sides are \cong and slopes
are perpendicular forming 4 RT \angle s

\therefore FGHE is a square (also a rectangle, rhombus
and parallelogram)