Name:_____ Date:_____ Period: _____

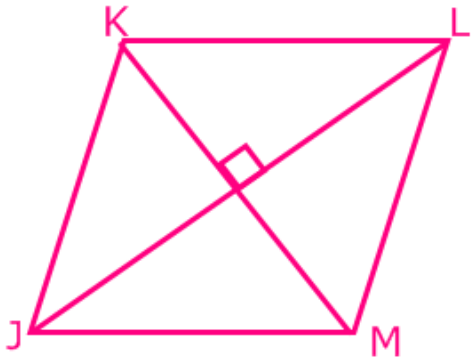
Chapter 10: Quadrilaterals
Topic 3: Rhombus

Rhombus:

A rhombus is a parallelogram which has two _____ consecutive sides.

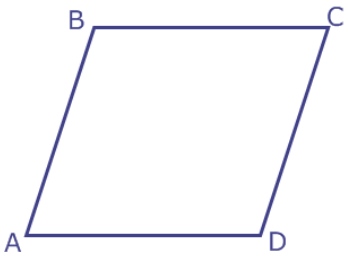
Properties:

- All the properties of a _____.
- Consecutive sides are _____.
- All of the sides are _____.
- Diagonals are _____.
- Diagonals _____ the angles.

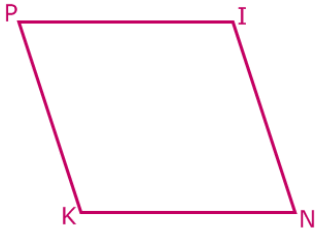


Examples:

1.) If ABCD is a parallelogram, with AB = 2x+1, DC = 3x - 10, and AD = x + 12, show that ABCD is a rhombus.



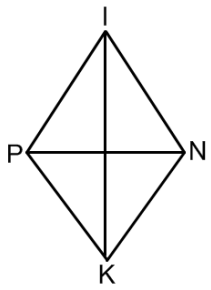
2.) In rhombus *PINK*, the diagonals measure 6 units and 8 units. What is the length of a side? What is the perimeter of the rhombus?



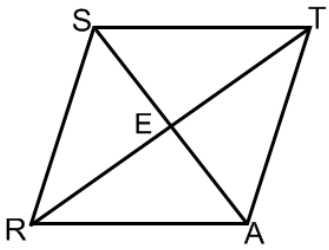
3.) PQRS is a rhombus. The shorter diagonal PR measures 12 units and the measure of <PQR = 60 degrees. Find the length of a side of the rhombus.

4.) In rhombus ABCD, the measure of <ABC = 120º. If AB = 10, then find the length of the shorter diagonal BD.

5.) In rhombus PINK, diagonals PN and IK are drawn. The measure of <IPN = 48°, what is the measure of <IKP?

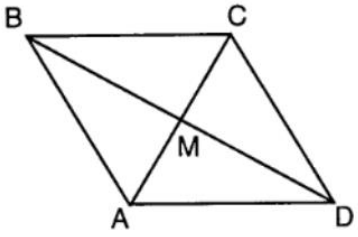


6.) In the diagram below of rhombus STAR, diagonals SA and TR intersect at point E. SE = 2x + 18, EA = 7x -12, RE = 6x + 1, ST = 3y + 14, and TA = 6y -22. What is the length of ET and RS?



7.) If x + 15 and 2x + 27 represent the number of degrees in the measures of two consecutive angles of a rhombus, find the value of x and the measure of both angles.

8.) In the accompanying diagram of rhombus ABCD, AC and BD are diagonals intersecting at point M. What is the perimeter of the rhombus if m<DAB = 120 and AC = 12?



(1) 48

(2) $48\sqrt{3}$

(3) $24\sqrt{3}$

(4) 24

Name:_____ Date:_____ Period:_____

Topic 3 Homework: Rhombus

Complete the following questions below.

1.) A quadrilateral whose diagonals bisect each other and are perpendicular is a

(1) rectangle (2) rhombus (3) parallelogram (4) square

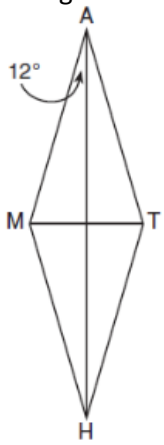
2.) In the diagram below, MATH is a rhombus with diagonals $\overline{AH}$ and $\overline{MT}$. If m<HAM = 12, what is m<AMT?

(1) 12

(2) 78

(3) 84

(4) 156



3.) Which reason could be used to prove that a parallelogram is a rhombus?

(1) Diagonals are congruent.
(2) Opposite sides are parallel.
(3) Diagonals are perpendicular.
(4) Opposite angles are congruent.

4.) Which quadrilateral has diagonals that always bisect its angles and also bisect each other?

(1) rhombus (2) rectangle (3) parallelogram (4) isosceles trapezoid

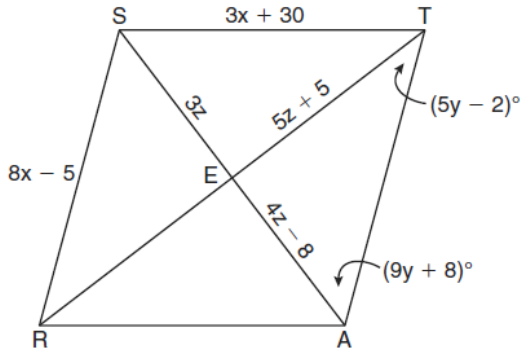
5.) One angle of a rhombus measures 60°. The length of the shorter diagonal is 12. What is the measure of the side of a rhombus?

6.) The diagonals of a rhombus and 20 cm and 16 cm. Find the perimeter of the rhombus, to the nearest tenth of a centimeter.

7.) The diagonals of a rhombus have lengths of 16 and 30. The length of a side of the rhombus is

(1) 17 (2) $15\sqrt{2}$ (3) $16\sqrt{2}$ (4) 34

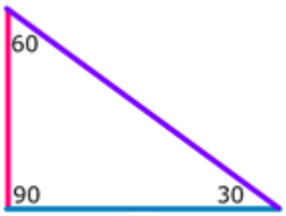
8.) In the diagram below, quadrilateral STAR is a rhombus with diagonals $\overline{SA}$ and $\overline{TR}$ intersecting at E.
ST = 3x+30, SR=8x – 5, SE = 3z, TE=5z+5, AE=4z – 8, m<RTA = 5y-2, and m<TAS = 9y + 8. Find SR, RT, and m<TAS.



Review Questions:

9.) In a right triangle, one leg is 3 more than the other, and the hypotenuse is 3 less than twice the shorter leg. Find the numerical value of the perimeter of this triangle.

10.) Write the ratios for the two special right triangles learned in Chapter 8 Topic 7. Label the triangle sides as well.



30° : 60° : 90°

_____:_____:____

45° : 45° : 90°

____:____:_____