

Lesson 10.6- SWBAT to understand and apply properties of squares.

1) Factor completely:  $6x^2 + 7x^2 - 49x$       2) Find the solution to:  $x^2 - 4x - 56 = 0$

$x(6x^2 + 7x - 49)$        $x(x-8)(x+7)$

$6x^2 + 21x - 14x - 49$        $x(x+7) - 7(x+7)$

$6x^2 + 21x - 14x - 49$        $0 = (x-8)(x+7)$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$a=6, b=7, c=-49$        $x-8=0 \Rightarrow x=8$

$x+7=0 \Rightarrow x=-7$

$x = \frac{7 \pm \sqrt{49 - 4(6)(-49)}}{12}$

$x = \frac{7 \pm \sqrt{49 + 1176}}{12}$

$x = \frac{7 \pm \sqrt{1225}}{12}$

$x = \frac{7 \pm 35}{12}$

$x = \frac{42}{12} = 3.5$  or  $x = \frac{-28}{12} = -2.33$

6)  $x=3, \sqrt{24} = DL$

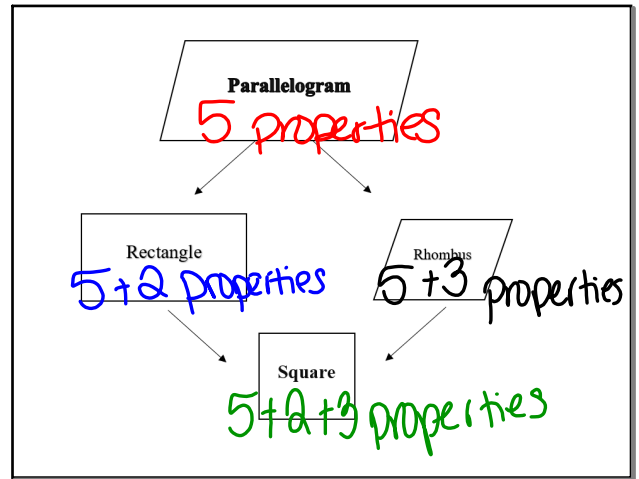
7) 38

8)  $x=3$

9)  $x=10$

10)  $x=10$

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Properties of Squares

1) ALL of the properties of a parallelogram.

- Opposite sides are //  $\rightarrow$  parallel
- Opposite sides are  $\cong$  Congruent
- Opposite angles are  $\cong$
- Consecutive angles are supplementary
- Diagonals bisect each other

Cut the diagonals into two equal parts (half).

Angles next to each other add to 180.

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2) ALL of the specific properties of a rectangle.

- All angles are right angles  $\rightarrow 90$
- Diagonals are congruent

Whole diagonals are equal.

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3) ALL of the specific properties of a rhombus.

- All sides are congruent  $\rightarrow$
- Diagonals bisect the angles
- Diagonals are perpendicular to each other.

Cut angle into two equal parts

makes right angles (90°)

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Examples:

1) Given square ABCD with  $AB = 5x - 3$  and  $BC = 2x + 12$ . Solve for CD.

$5x - 3 = 2x + 12$

$-2x -2x$

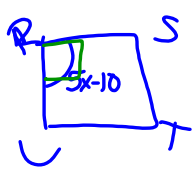
$3x = 15$

$\div 3$

$x = 5$

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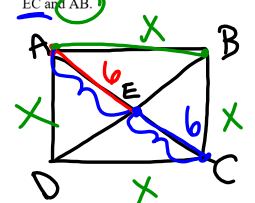
2) In square RSTU,  $M < R = 5x - 10$ . Solve for x.



$$\begin{aligned}
 5x - 10 &= 90 \\
 +10 &+10 \\
 \hline
 5x &= 100 \\
 \frac{5}{5} &\frac{100}{5} \\
 \hline
 x &= 20
 \end{aligned}$$

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3) In square ABCD, the diagonals intersect at E. The perimeter of the square is 40 and  $AE = 6$ . Find EC and AB.



$EC = 6$      $AB = 10$

$$\begin{aligned}
 x + x + x + x &= 40 \\
 4x &= 40 \\
 \frac{4}{4} &\frac{40}{4} \\
 \hline
 x &= 10
 \end{aligned}$$

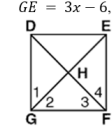
$P = 40$

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4) What is the length of the diagonal of a square whose side length is 12?

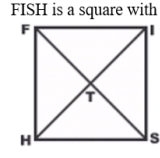
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5) In the diagram below, DEFG is a square with diagonals GE and DF. If  $DF = 5x - 14$  and  $GE = 3x - 6$ , find the value of x.



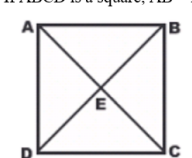
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6) FISH is a square with  $IT = 6$ . Find IH.



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7) If ABCD is a square,  $AB = 2x + 4$  and  $CD = 3x - 5$ , find BC.



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