Lesson 10.3- SWBAT solve problems using properties of parallelograms and rectangles.

Kick off-

1) Factor $3p^2 - 2p - 5$

2) Solve by factoring: $3p^2 - 2p - 5 = 0$

-15

$3 \cdot 5$

$1 \cdot 15$

$(3p^2 + 3p)(-5p - 5)$

$3p(p+1) - 5(p+1)$

$(3p-5)(p+1)$

$-(3p-5)(p+1) = 0$

$3p - 5 = 0 \quad | \quad p + 1 = 0$

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① m 5 N 4 12 P m 5 N x 12 O
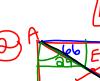
$a^2 + b^2 = c^2$
$5^2 + 12^2 = x^2$
$25 + 144 = x^2$
$\sqrt{169} = \sqrt{x^2}$
$13 = x$

② A 66 E B 90
24 -66
D C 24

③ A B $4x + 14 = 5x - 3$
$-4x \quad -4x$
D C $14 = x - 3$
$+3 \quad +3$
$17 = x$

④ R S
$3x + 6$
U $3x + 6$ T
$3(11) + 6$
39

$5x - 4 + 3x + 6 = 90$
$8x + 2 = 90$
$-2 \quad -2$
$\frac{8x}{8} = \frac{88}{8}$
$x = 11$
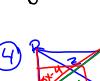
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Properties of Polygons

Parallelogram 5 properties	Rectangle 5 + 2 properties
① Opposite Sides are parallel (‖)	
② Opposite Sides are congruent (≅)	#1-5 are the properties of the parallelogram!
③ Opposite angles are congruent (≅)	⑥ All angles are 90° or right angles.
④ Consecutive angles are supplementary. (add to 180°)	⑦ Diagonals are Congruent (≅)
⑤ Diagonals bisect each other. *Cut in half (equal parts)	* Whole diagonals are equal

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Examples:

1) In the diagram below is parallelogram UVWX. From this diagram, solve for x.

V $70°$ W
$10x - 5$ $45°$
U X

$10x - 5 + 70 + 45 = 180$
$10x + 110 = 180$
$-110 \quad -110$
$\frac{10x}{10} = \frac{70}{10}$
$x = 7$

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homework

2) In the diagram below is parallelogram ABCD. From this diagram, find the m< C.

B $64°$ C
$2x + 18$
$5x + 14$
A D

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3) In rectangle QRST, find m< RSQ.

T Q
$39x$
S $51x$ R

$51(1)$
$51°$

$39x + 51x = 90$
$\frac{90x}{90} = \frac{90}{90}$
$x = 1$

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4) In the diagram below, parallelogram BCDE has diagonals EC and BD that intersect at Q. If diagonal CE = 26 and QE = 2x+11. Solve for x.
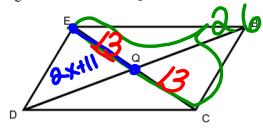
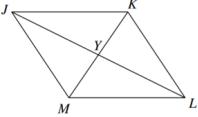$$2x+11=13$$
$$-11\ -11$$
$$2x = 2$$
$$\frac{2x}{2} = \frac{2}{2}$$
$$\boxed{x = 1}$$

$$\frac{1}{2}(26)$$
$$13$$

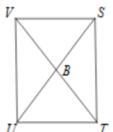5) In parallelogram JKLM there are diagonals JL and KM that intersect at Y. If LY = 7 and $JY = 2x - 9$. Solve for x.

homework!
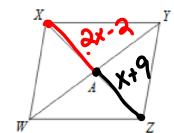
6) In rectangle STUV, there is diagonal VT and SU that intersect at B. If $TB = 2x - 13$ and $BV = x - 2$, solve for TB.

homework

7) In parallelogram XYWZ, there are diagonals XZ and WT that intersect at A. If $XA = 2x - 2$ and $AZ = x + 9$. Find XA.
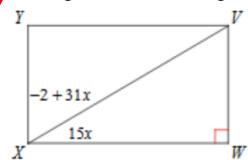
$$2x-2 = x+9$$
$$-x\quad\ -x$$
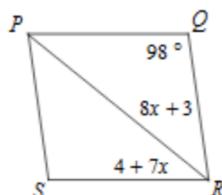$$x-2 = 9$$
$$+2\ +2$$
$$x = 11$$

$$2(11)-2$$
$$\boxed{20}$$

8) In the diagram below is a rectangle. Using the diagram, solve for x.

$-2 + 31x$
$15x$

homework

9) In the diagram below is a parallelogram. Using the diagram, solve for the m<QRS.
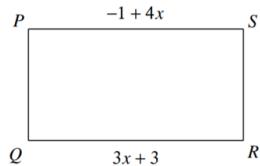
98°
$8x + 3$
$4 + 7x$

2

10) In the diagram below is rectangle PQRS. Using the diagram solve for RQ.

P ———— $-1 + 4x$ ———— S

Q ———— $3x + 3$ ———— R

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11) In the diagram below is DEFG. Using the diagram solve for angle G.

F — $3x + 11$ — E

G — $5x - 9$ — D
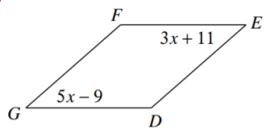
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12) If BD = 3x – 7 and CA = x + 5, find BD, ED, CA, and AE.

A — $x+5$ — B
E
$3x-7$
D — C

Rectangle.

$3(6)-7$
11

BD = 11
ED = 5.5
CA = 11
AE = 5.5

$x + 5 = 3x - 7$
$-x \quad -x$
$5 = 2x - 7$
$+7 \quad +7$
$\dfrac{12}{2} = \dfrac{2x}{2}$
$6 = x$

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