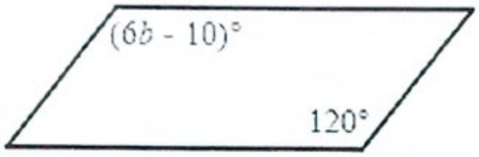
Name Key Period

Secondary 2 Honors **Properties of Parallelograms** **Assignment 1.3**

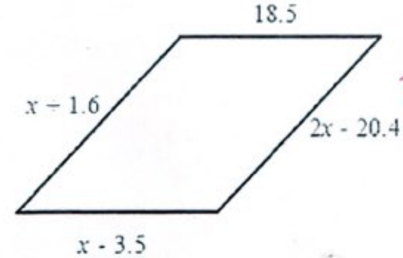
What would the value of the variable need to be in order for the quadrilateral to be a parallelogram?

1.



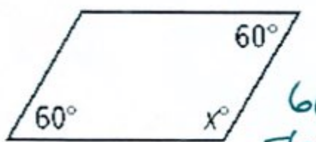
$6b - 10 = 120$
$+10 \quad +10$
$\frac{6b}{6} = \frac{130}{6}$
$\boxed{b = 21.\overline{6}}$

2.



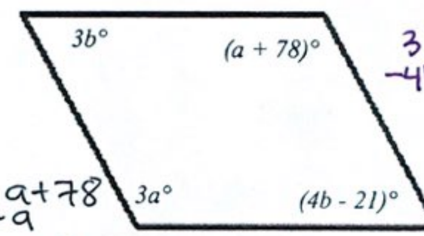
$x - 3.5 = 18.5$
$+3.5 \quad +3.5$
$\boxed{x = 22}$

3.



$60 + x = 180$
$-60 \quad -60$
$\boxed{x = 120}$

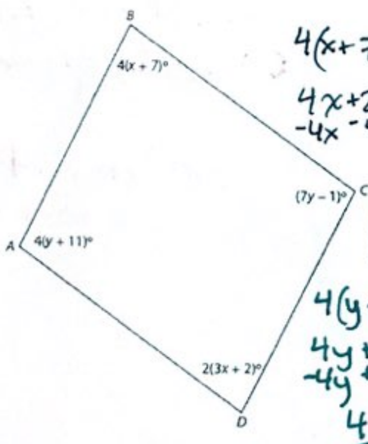
4.



$3b = 4b - 21$
$-4b \quad -4b$
$\frac{-b}{-1} = \frac{-21}{-1}$
$\boxed{b = 21}$

$3a = a + 78$
$-a \quad -a$
$\frac{2a}{2} = \frac{78}{2}$
$\boxed{a = 39}$

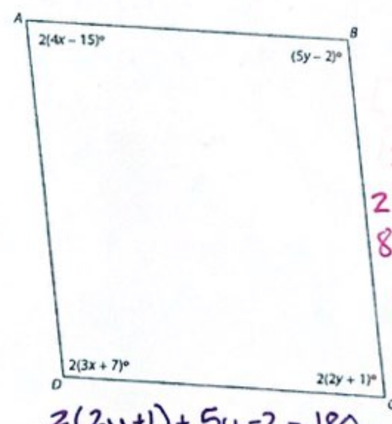
5.



$4(x+7) = 2(3x+2)$
$4x + 28 = 6x + 4$
$-4x - 4 \quad -4x - 4$
$\frac{24}{2} = \frac{2x}{2}$
$\boxed{x = 12}$

$4(y+11) = 7y - 1$
$4y + 44 = 7y - 1$
$-4y + 1 \quad -4y + 1$
$\frac{45}{3} = \frac{3y}{3}$
$\boxed{15 = y}$

6.

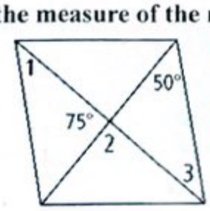


$2(4x-15) + 2(3x+7) = 180$
$8x - 30 + 6x + 14 = 180$
$14x - 16 = 180$
$+16 \quad +16$
$\frac{14x}{14} = \frac{196}{14}$
$\boxed{x = 14}$

$2(2y+1) + 5y - 2 = 180$
$4y + 2 + 5y - 2 = 180$
$\frac{9y}{9} = \frac{180}{9}$
$\boxed{y = 20}$

Find the measure of the numbered angles for each parallelogram.

7.



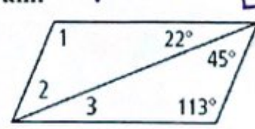
$180 - 75 = \boxed{105° = \angle 2}$

$105 = 50 + \angle 3$
$-50 \quad -50$
$\boxed{55° = \angle 3}$

ext. angle theorem

$\boxed{\angle 1 = 55°}$

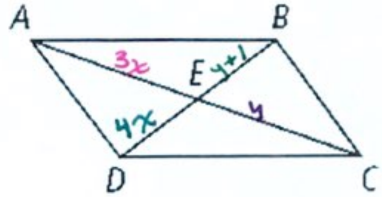
8.



$\angle 1 = 113°$
$\angle 2 = 45°$
$\angle 3 = 22°$

$\square ABCD$ **is a parallelogram. Find the value of x and y and the length of each diagonal.**

9. $AE = 3x$, $EC = y$, $DE = 4x$, $EB = y + 1$



$3x = y$ $\quad$ $4x = y+1$

$4x = 3x + 1$

$-3x \quad -3x$

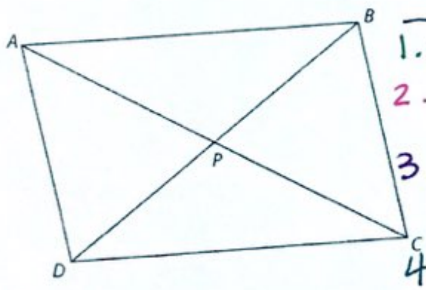
$\boxed{x = 1}$

$3(1) = y$

$\boxed{3 = y}$

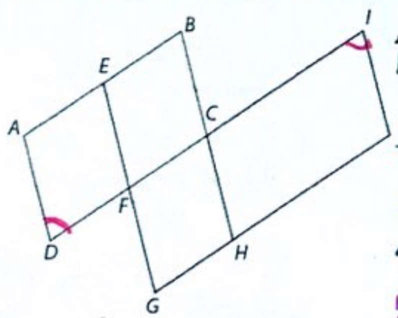
Proofs: Construct a proof for the following problems.

10. Given that $\square ABCD$ is a parallelogram, prove that $\triangle DPA \cong \triangle BPC$



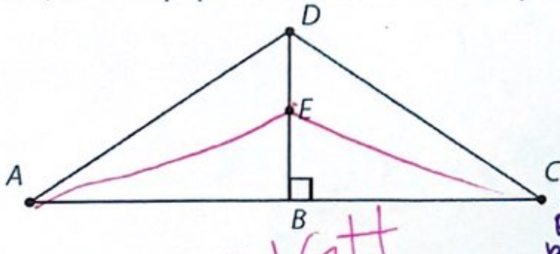
Statement	Reason
1. $\square ABCD$ is a parallelogram	1. Given
2. $\overline{AD} \cong \overline{BC}$	2. Opposite sides of a parallelogram are congruent
3. $\overline{DP} \cong \overline{PB}$ and $\overline{AP} \cong \overline{PC}$	3. Diagonals of a parallelogram bisect each other
4. $\triangle DPA \cong \triangle BPC$	4. SSS Triangle Congruence

11. Given that $\square ABCD$, $\square EBHG$, *and* $\square FIJG$ are parallelograms, prove that $\angle D \cong \angle I$



Statement	Reason
1. $\square ABCD$, $\square EBHG$, $\square FIJG$ are parallelogrames	1. Given
2. $\angle D \cong \angle B$	2. Opposite $\angle$'s of a $\square$ are congruent
3. $\angle B \cong \angle G$	3. " "
4. $\angle G \cong \angle I$	4. " "
5. $\angle D \cong \angle I$	5. Substitution.

12. Prove that a point on a perpendicular bisector is equidistant from the endpoints of the segment it bisects given that in $\triangle ACD$, $\overline{BD}$ is the perpendicular bisector of $\overline{AC}$ and point E is on $\overline{BD}$. Write your answer in a proof.



Given:

$\overline{DB}$ is the perpendicular bisector of $\overline{AC}$.

E is a point on $\overline{DB}$.

Prove:

$EA = EC$

NOT ENOUGH ROOM!!

Statement	Reason
1. $\overline{DB}$ is the perpendicular bisector of $\overline{AC}$	1. Given
2. Draw $\overline{EA}$ and $\overline{EC}$	2. construction
3. $AB \cong BC$	3. Definition of Bisector
4. $EB \cong BE$	4. Reflective Property
5. $\angle ABE = 90 = \angle CBE$	5. Perpendicular
6. $\triangle ABE \cong \triangle CBE$	6. SAS
7. $EA \cong EC$	7. CPCTC