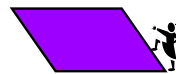


6.2: Properties of Parallelograms

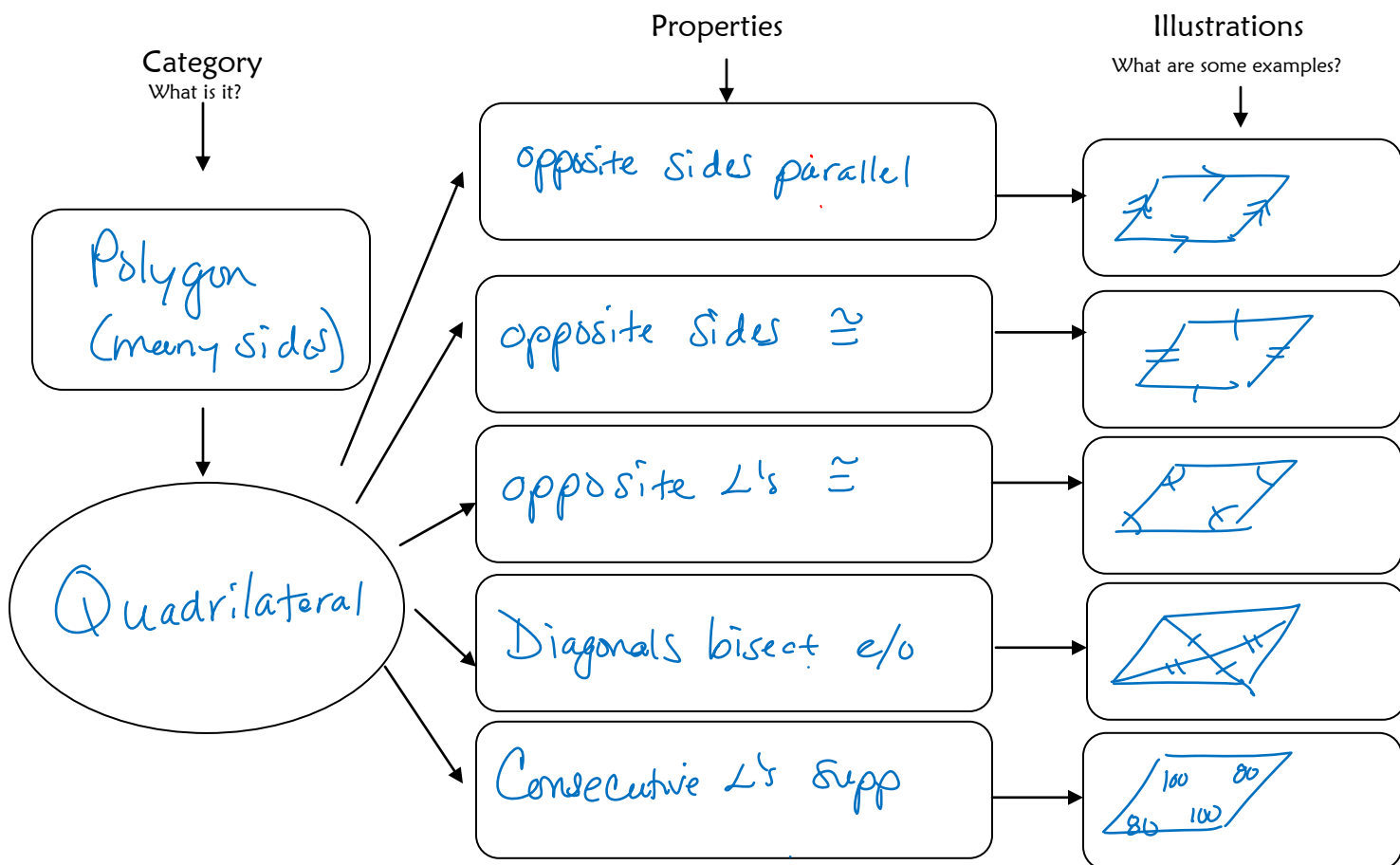


Target: Use properties of parallelograms to solve algebraic problems.
 Target: Use the properties of a parallelogram to write a two-column proof.

QUADRILATERALS

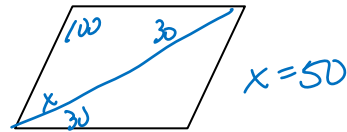
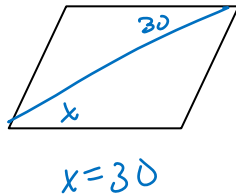
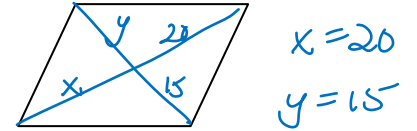
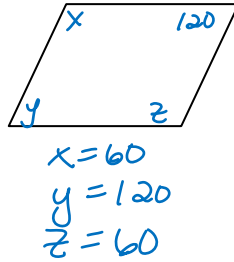
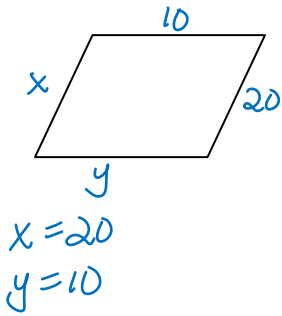
<p>Characteristics</p> <ul style="list-style-type: none"> - made up of segments - consecutive sides intersect at vertices - closed 	<p>Non-Characteristics</p> <ul style="list-style-type: none"> - Curved sides - open - non consecutive sides intersect - more/less than 4 sides
<p>Definition</p> <p>4 sided polygon</p>	
<p>Examples</p>	<p>Non-Examples</p>

PARALLELOGRAMS

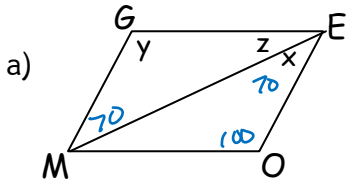


Properties as a conditional: IF , THEN property

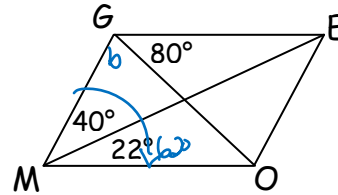
Apply the Properties of Parallelograms to these examples to solve for the missing variables:



Find the missing angles in the parallelograms.



$x = 70$ $y = 100$ $z = 10$



$a = 40$ $b = 38$

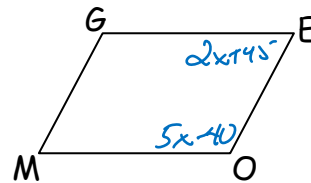
Given: GEOM is a \square
 $\angle GEO = (2x + 45)$
 $\angle EOM = (5x - 40)$

Find x.

$$2x + 45 + 5x - 40 = 180$$

$$\begin{array}{r} 7x + 5 = 180 \\ \underline{ + 5} \\ 7x = 175 \\ \underline{ \div 7} \\ x = 25 \end{array}$$

$x = 25$

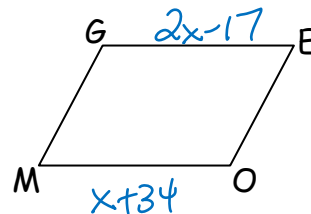


Given: GEOM is a \square
 $OM = x + 34$
 $GE = 2x - 17$

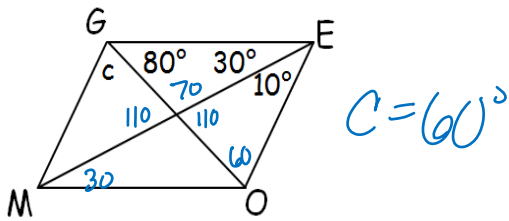
Find GE.

$$\begin{array}{r} 2x - 17 = x + 34 \\ \underline{-x -x} \\ x - 17 = 34 \\ \underline{ + 17 + 17} \\ x = 51 \end{array}$$

$x = 51$

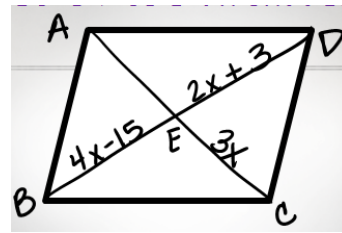


Find angle c in the parallelogram.



$C = 60^\circ$

Find AE in parallelogram ABCD.



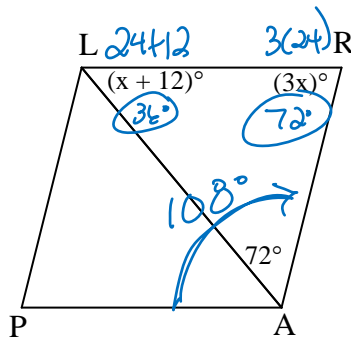
$$\begin{aligned} 4x - 15 &= 2x + 3 \\ -2x &\quad -2x \\ \hline 2x - 15 &= 3 \\ +15 &\quad +15 \\ \hline 2x &= 18 \\ \frac{2x}{2} &= \frac{18}{2} \\ x &= 9 \end{aligned}$$

$AE = EC = 3(9)$
 $= 27$

Given: PLRA is a parallelogram.

Find $m\angle RLA = 36^\circ$

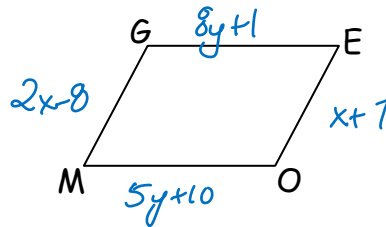
Find $m\angle RAP = 108^\circ$



$$\begin{aligned} x + 12 + 3x + 72 &= 180 \\ 4x + 84 &= 180 \\ -84 &\quad -84 \\ \hline 4x &= 96 \\ \frac{4x}{4} &= \frac{96}{4} \\ x &= 24 \end{aligned}$$

Given: GEOM is a \square .

$GM = 2x - 8$
 $MO = 5y + 10$
 $OE = x + 7$
 $GE = 8y + 1$



Find: x and y

$$\begin{aligned} 8y + 1 &= 5y + 10 \\ -5y &\quad -5y \\ \hline 3y + 1 &= 10 \\ -1 &\quad -1 \\ \hline 3y &= 9 \\ y &= 3 \end{aligned}$$

$$\begin{aligned} 2x - 8 &= x + 7 \\ -x &\quad -x \\ \hline x - 8 &= 7 \\ +8 &\quad +8 \\ \hline x &= 15 \end{aligned}$$

$x = 15$

Given Parallelogram TYLE, answer the following:

a. If $LY = 12$, then $ET = 12$.

b. If $YT = 22$, then $LE = 22$.

c. If $m\angle LYT = 72^\circ$, then $m\angle LET = 72^\circ$

and $m\angle YLE = 108^\circ$. $180 - 72$

d. If $m\angle LYT = 60^\circ$, then $m\angle LET = 60^\circ$ and $m\angle YLE = 120^\circ$. $180 - 60$

e. If $LR = 5$, then $RT = 5$ and $LT = 10$.

f. If $YE = 24$, then $YR = 12$ and $RE = 12$

