

Name: Key

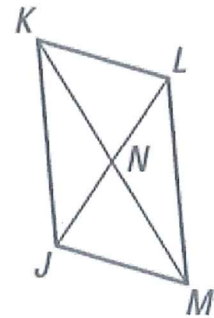
Focus Special Parallelogram Practice

Name the complete each statement about parallelogram JKLM. Show your justification for each.

1. $\angle LMJ \cong \angle LKM$ because op. \angle s of a para are \cong .

2. $LK \parallel JM$ because def of parallelogram

3. $KN \cong MN$ because diags of a parallelogram bisect each other.



4. RSTU is a parallelogram. $RO = y + 3$, $SO = 2x$; $TO = 3y - 7$; $UO = x + 5$. Find x and y. You MUST show your geometry and justify.

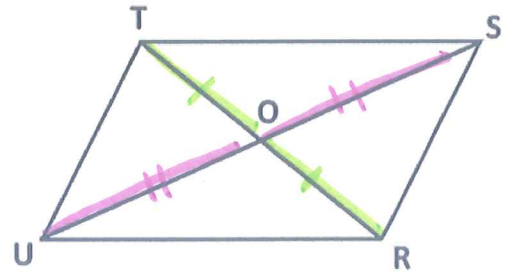
Find x:

Geometry:

$$\begin{aligned} SO &\cong UO \\ 2x &= x + 5 \\ \boxed{x = 5} \end{aligned}$$

Justify:

diags of a para bisect each other



Find y:

Geometry:

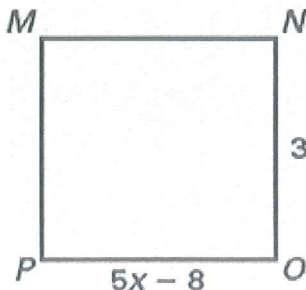
$$\begin{aligned} RO &\cong TO \\ y + 3 &= 3y - 7 \\ 3 &= 2y - 7 \\ 10 &= 2y \\ \boxed{5 = y} \end{aligned}$$

Justify:

diags of parallelograms bisect each other.

5. MNOP is a square. Find x. You MUST show your geometry and justify.

Find x:



Geometry:

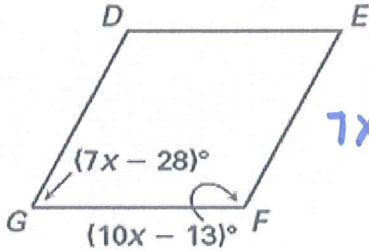
$$\begin{aligned} NO &\cong PO \\ 3x + 14 &= 5x - 8 \\ 14 &= 2x - 8 \\ 22 &= 2x \\ \boxed{11 = x} \end{aligned}$$

Justify:

def of a square.

6. DEFG is a rhombus. Find x. You MUST show your geometry and justify.

Find x:



Geometry:

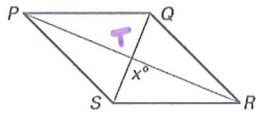
$$\begin{aligned} \angle G + \angle F &= 180^\circ \\ 7x - 28 + 10x - 13 &= 180^\circ \\ 17x - 41 &= 180 \\ 17x &= 221 \\ \boxed{x = 13} \end{aligned}$$

Justify:

cons. int \angle s are suppl.

7. PQRS is a rhombus. Find x. You MUST show your geometry and justify.

Find x:



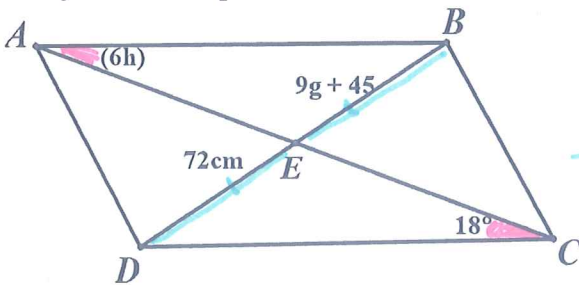
Geometry:

$$\begin{aligned} \angle STR &= 90^\circ \\ \boxed{x = 90^\circ} \end{aligned}$$

Justify:

diags of a rhombus are \perp .

8. ABCD is a parallelogram. Solve for h and g and show your geometry and justifications for your set up.



Find g:

Geometry:

$$\begin{aligned} DE &\cong BE \\ 72 &= 9g + 45 \\ 27 &= 9g \\ \boxed{3} &= g \end{aligned}$$

Justify:

diags of a para bisect each other

Find h:

Geometry:

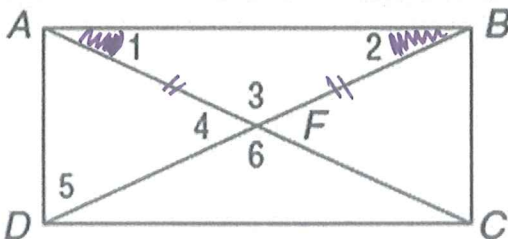
$$\begin{aligned} \angle BAC &\cong \angle DCA \\ 6h &= 18 \\ \boxed{h = 3} \end{aligned}$$

Justify:

alt int \angle s are \cong

9. If $m\angle 1 = 12x + 4$ and $m\angle 2 = 16x - 12$ in rectangle ABCD, find x. You MUST show your geometry and justify.

Find x:



Geometry:

$$\begin{aligned} \angle 1 &\cong \angle 2 \\ 12x + 4 &= 16x - 12 \\ -12x & \quad -12x \\ 4 &= 4x - 12 \\ +12 & \quad +12 \\ 16 &= 4x \\ \frac{16}{4} &= \frac{4x}{4} \\ \boxed{4 = x} \end{aligned}$$

Justify:

base \angle s of isosceles Δ s are \cong .

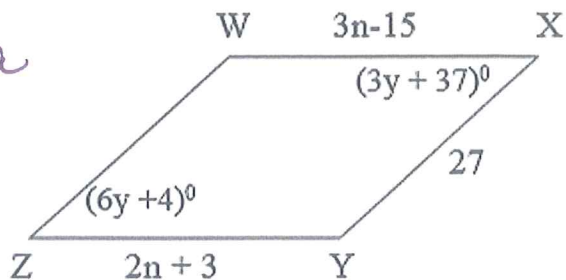
10. WXYZ is a parallelogram. Find n , y , and $m\angle Z$. You MUST show your geometry and justify.

Find n :

Geometry:

$$\begin{aligned}ZY &\cong XW \\ 2n+3 &= 3n-15 \\ 3 &= n-15 \\ \boxed{18} &= n\end{aligned}$$

Justify:
op. sides of a para
are \cong



Find y :

Geometry:

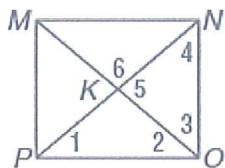
$$\begin{aligned}\angle Z &\cong \angle X \\ 6y+4 &= 3y+37 \\ -3y & \quad -3y \\ 3y+4 &= 37 \\ -4 & \quad -4 \\ 3y &= 33 \\ \boxed{y} &= 11\end{aligned}$$

Justify:
op \angle s of a para
are \cong .

Find $m\angle Z$. (No geo or just)

$$\begin{aligned}\angle Z &= 6(11) + 4 \\ \boxed{\angle Z} &= 70^\circ\end{aligned}$$

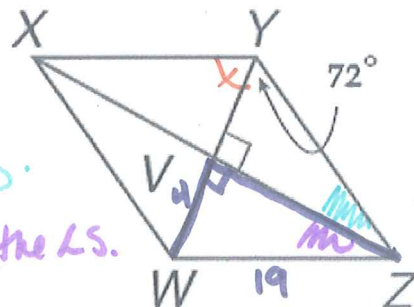
11. MNOP is a square. Find all numbered angles and justify your reasoning.



- $m\angle 1 = 45^\circ$ because diags bisect the Right \angle s.
- $m\angle 2 = 45^\circ$ because diags of a square bisect the \angle s.
- $m\angle 3 = 45^\circ$ because "
- $m\angle 4 = 45^\circ$ because "
- $m\angle 5 = 90^\circ$ because diags of a square are \perp
- $m\angle 6 = 90^\circ$ because "

12. Use Rhombus WXYZ.

- a. Find $m\angle WYX$. 72° because diags of a Rhombus bisect the angles.
- b. Find $m\angle YZX$. 18° because Δ sum $90 + 72 + ? = 180$.
- c. Find $m\angle WZX$. 18° because diags of a Rhombus bisect the \angle s.
- d. Find $m\angle YZW$. 36° because angle addition
- e. If $WZ = 19m$, find YZ . $19m$ because def of a Rhombus.
- f. If $WZ = 19m$ and $VW = 4m$, find VZ .



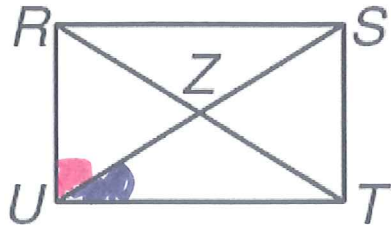
$$\begin{aligned}4^2 + x^2 &= 19^2 \\ x^2 + 16 &= 361 \\ \sqrt{x^2} &= \sqrt{345}\end{aligned}$$

Can't simplify

$VZ = \sqrt{345}$

(Rectangle)

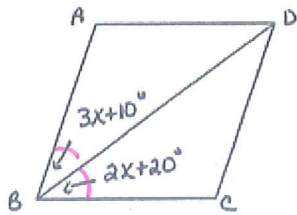
13. If $m\angle SUT = 3x + 6$ and $m\angle RUS = 5x - 4$, find $m\angle SUT$. You MUST show your geometry and justify.



Geometry: $\angle SUT + \angle RUS = 90^\circ$
 $3x + 6 + 5x - 4 = 90$
 $8x + 2 = 90$
 $8x = 88$
 $x = 11$
 $\angle SUT = 3(11) + 6$
 $\angle SUT = 39^\circ$

Justify: def of rectangle.

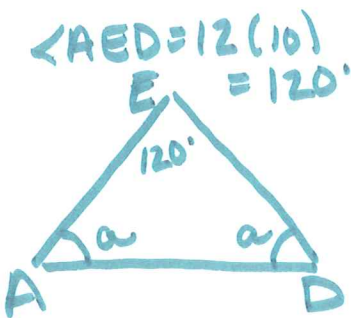
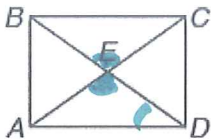
14. ABCD is a rhombus. Find x. You MUST show your geometry and justify.



Find x:
 Geometry: $\angle ABD \cong \angle CBD$
 $3x + 10 = 2x + 20$
 $x + 10 = 20$
 $x = 10$

Justify: diags of a rhombus bisect the angles!

15. ABCD is a rectangle. If $m\angle AED = 12x$ and $m\angle BEC = 10x + 20$, find $m\angle EDA$. You MUST show your geometry and justify.



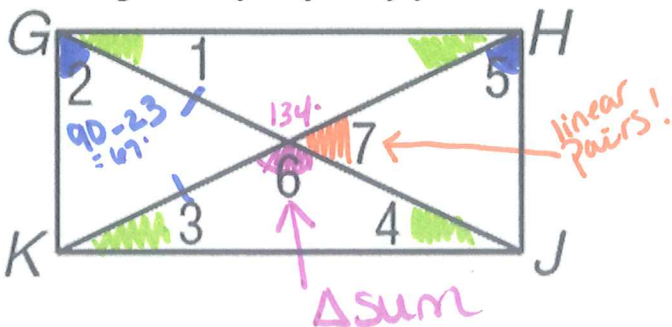
Find x:
 Geometry: $\angle AED \cong \angle BEC$
 $12x = 10x + 20$
 $2x = 20$
 $x = 10$

Justify: vertical \angle s are \cong

Δ Sum!!!
 $a + a + 120 = 180$
 $2a + 120 = 180$
 $2a = 60$
 $a = 30$

$x = 10$
 $m\angle EDA = 30^\circ$

16. GHJK is a rectangle. If $m\angle 1 = 23^\circ$, find all remaining numbered angles. You do not need to show geometry or justify your work.



$m\angle 2 = 67^\circ$ $m\angle 3 = 23^\circ$

$m\angle 4 = 23^\circ$ $m\angle 5 = 67^\circ$

$m\angle 6 = 134^\circ$ $m\angle 7 = 46^\circ$

Name: _____

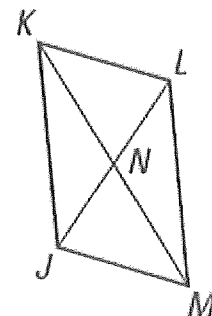
Focus Special Parallelogram Practice

Name the complete each statement about parallelogram JKLM. Show your justification for each.

1. $\angle LMJ \cong$ _____ because _____

2. $LK \parallel$ _____ because _____

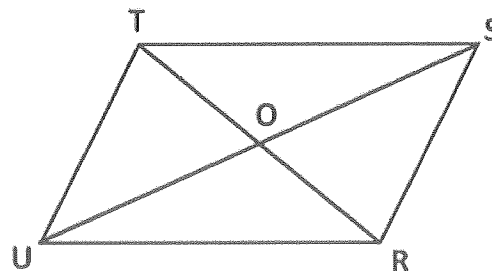
3. $KN \cong$ _____ because _____



4. RSTU is a parallelogram. $RO = y + 3$, $SO = 2x$; $TO = 3y - 7$; $UO = x + 5$. Find x and y. You MUST show your geometry and justify.

Find x:
Geometry:

Justify:



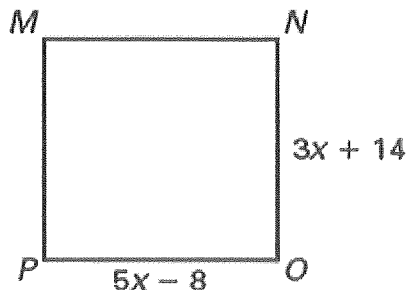
$x =$ _____

Find y:
Geometry:

Justify:

$y =$ _____

5. MNOP is a square. Find x. You MUST show your geometry and justify.

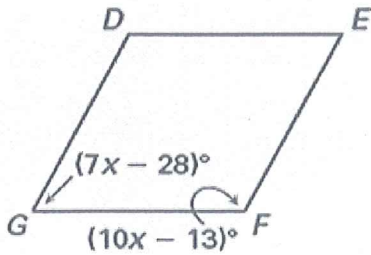


Find x:
Geometry: Justify:

$x =$ _____

6. DEFG is a rhombus. Find x. You MUST show your geometry and justify.

Find x:



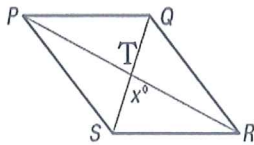
Geometry:

Justify:

$x = \underline{\hspace{2cm}}$

7. PQRS is a rhombus. Find x. You MUST show your geometry and justify.

Find x:

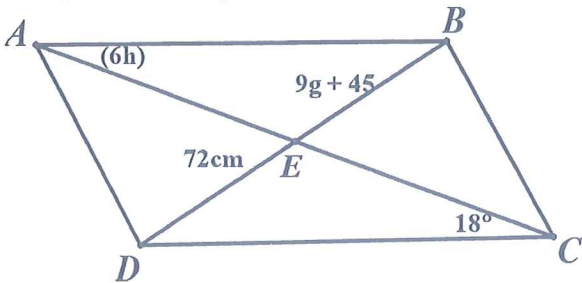


Geometry:

Justify:

$x = \underline{\hspace{2cm}}$

8. ABCD is a parallelogram. Solve for **h and g** and show your geometry and justifications for your set up.



Find g:

Geometry:

Justify:

$g = \underline{\hspace{2cm}}$

Find h:

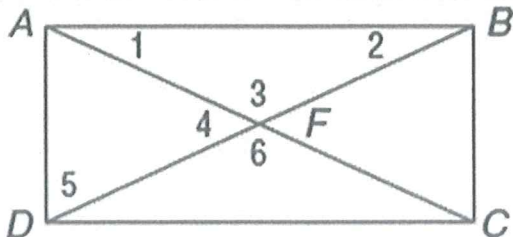
Geometry:

Justify:

$h = \underline{\hspace{2cm}}$

9. If $m\angle 1 = 12x + 4$ and $m\angle 2 = 16x - 12$ in rectangle ABCD, find x. You MUST show your geometry and justify.

Find x:



Geometry:

Justify:

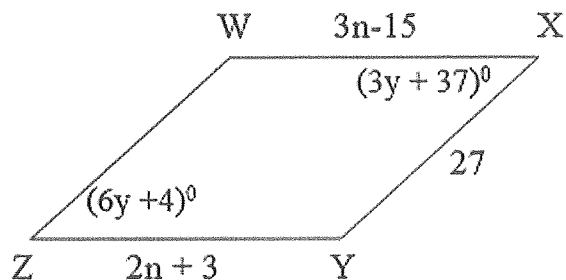
$x = \underline{\hspace{2cm}}$

10. WXYZ is a parallelogram. Find n , y , and $m\angle Z$. You MUST show your geometry and justify.

Find n :

Geometry:

Justify:



$n = \underline{\hspace{2cm}}$

Find y :

Geometry:

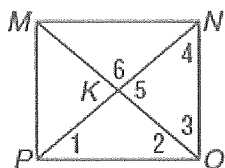
Justify:

Find $m\angle Z$. (No geo or just)

$y = \underline{\hspace{2cm}}$

$m\angle Z = \underline{\hspace{2cm}}$

11. MNOP is a square. Find all numbered angles and justify your reasoning.



$m\angle 1 = \underline{\hspace{2cm}}$ because $\underline{\hspace{2cm}}$

$m\angle 2 = \underline{\hspace{2cm}}$ because $\underline{\hspace{2cm}}$

$m\angle 3 = \underline{\hspace{2cm}}$ because $\underline{\hspace{2cm}}$

$m\angle 4 = \underline{\hspace{2cm}}$ because $\underline{\hspace{2cm}}$

$m\angle 5 = \underline{\hspace{2cm}}$ because $\underline{\hspace{2cm}}$

$m\angle 6 = \underline{\hspace{2cm}}$ because $\underline{\hspace{2cm}}$

12. Use Rhombus WXYZ.

a. Find $m\angle WYX$. $\underline{\hspace{2cm}}$ because $\underline{\hspace{2cm}}$

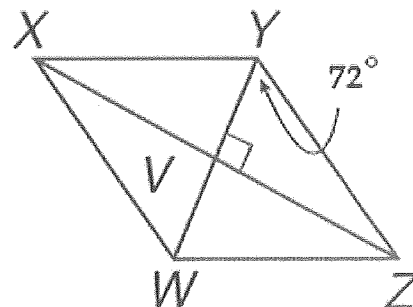
b. Find $m\angle YZX$. $\underline{\hspace{2cm}}$ because $\underline{\hspace{2cm}}$

c. Find $m\angle WZX$. $\underline{\hspace{2cm}}$ because $\underline{\hspace{2cm}}$

d. Find $m\angle YZW$. $\underline{\hspace{2cm}}$ because $\underline{\hspace{2cm}}$

e. If $WZ = 19m$, find YZ . $\underline{\hspace{2cm}}$ because $\underline{\hspace{2cm}}$

f. If $WZ = 19m$ and $VW = 4m$, find VZ .

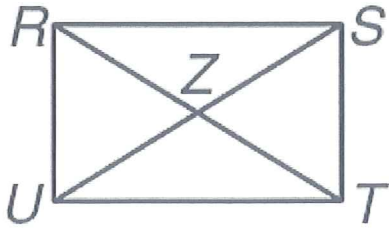


$VZ = \underline{\hspace{2cm}}$

13. If $m\angle SUT = 3x + 6$ and $m\angle RUS = 5x - 4$, find $m\angle SUT$ if $URST$ is a rectangle. You MUST show your geometry and justify.

Geometry:

Justify:



$x = \underline{\hspace{2cm}}$

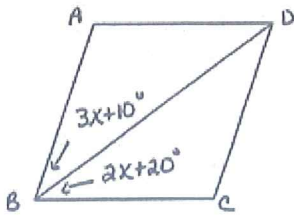
$\angle SUT = \underline{\hspace{2cm}}$

14. ABCD is a rhombus. Find x . You MUST show your geometry and justify.

Find x :

Geometry:

Justify:



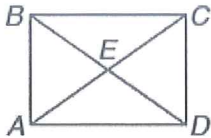
$x = \underline{\hspace{2cm}}$

15. ABCD is a rectangle. If $m\angle AED = 12x$ and $m\angle BEC = 10x + 20$, find $m\angle EDA$. You MUST show your geometry and justify.

Find x :

Geometry:

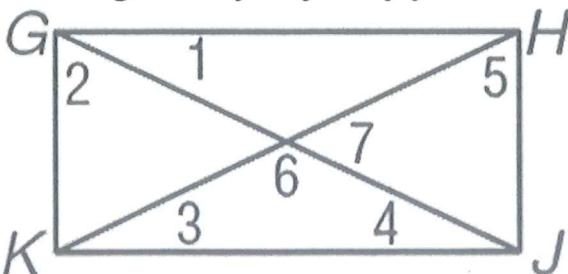
Justify:



$x = \underline{\hspace{3cm}}$

$m\angle EDA = \underline{\hspace{3cm}}$

16. GHJK is a rectangle. If $m\angle 1 = 23^\circ$, find all remaining numbered angles. You do not need to show geometry or justify your work.



$m\angle 2 = \underline{\hspace{2cm}}$ $m\angle 3 = \underline{\hspace{2cm}}$

$m\angle 4 = \underline{\hspace{2cm}}$ $m\angle 5 = \underline{\hspace{2cm}}$

$m\angle 6 = \underline{\hspace{2cm}}$ $m\angle 7 = \underline{\hspace{2cm}}$