

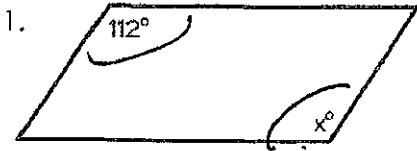
Properties of Parallelograms

What do we know about Quadrilaterals???

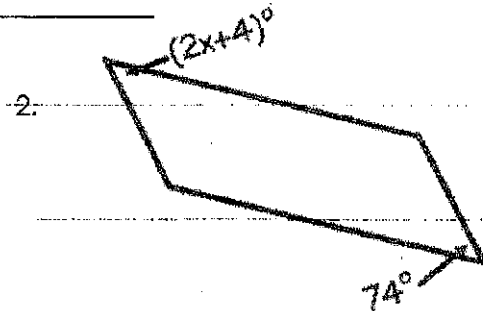
Parallelograms???

1. Opposite angles of a parallelogram are congruent.
2. Opposite sides of a parallelogram are congruent.
3. Consecutive angles in a parallelogram are supplementary.
4. The diagonals of a parallelogram bisect each other.

1st Property: opposite \angle 's are \cong



$x = 112^\circ$



$x = 35$

$$\begin{aligned} 2x + 4 &= 74 \\ 2x &= 70 \\ x &= 35 \end{aligned}$$

2nd Property:

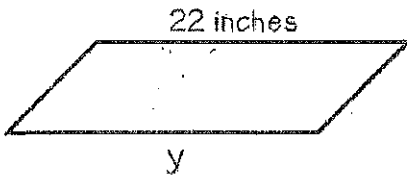
Opp. sides are \cong

$$4y - 3 = y + 3$$

$$3y = 6$$

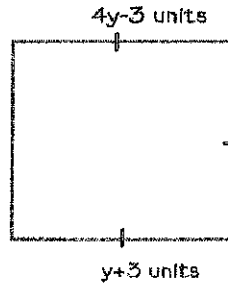
$$y = 2$$

3.

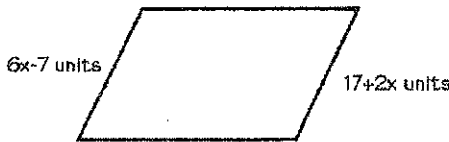


$y = 22$

4.



5.



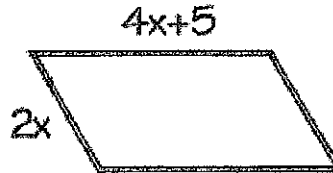
$x = 6$

$$6x - 7 = 17 + 2x$$

$$4x = 24$$

$$x = 6$$

6.



$$4x + 5 = 2x$$

$$\frac{4x}{-4x} + \frac{5}{-2} = \frac{2x}{-2}$$

$$\frac{5}{-2} = \frac{2x}{-2}$$

$$-5/2 = x$$

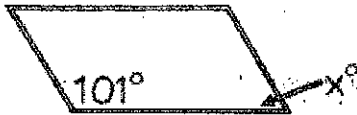
What is wrong with this logic?

Not opp. sides

3rd Property:

Consecutive angles supplementary.

7.



$$101 + x = 180$$

$x = 79^\circ$

8.



$$2x + 42 + 10x + 18 = 180$$

$$12x + 60 = 180$$

$$\underline{\hspace{2cm}} + \underline{\hspace{2cm}} = 180$$

$$\underline{\hspace{2cm}} = 180$$

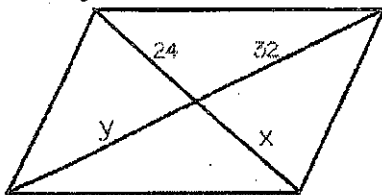
$x = 10$

4th Property:

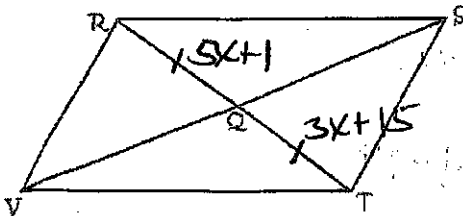
Diagonals of ~~parallelogram~~ parallelogram bisect each other.

$x = 24$

$y = 32$



10. In \square RSTV, diagonals RT and VS intersect at Q. If $RQ = 5x + 1$ and $QT = 3x + 15$, find QT.



$x = 7$

$$5x + 1 = 3x + 15$$

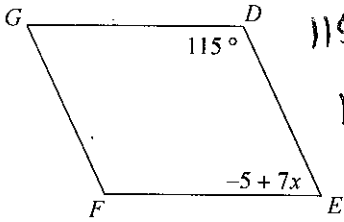
(now plug in x to get QT)

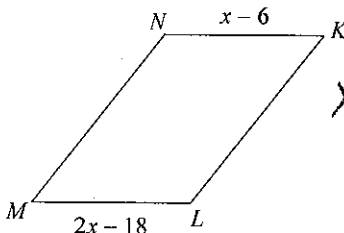
$$2x = 14$$

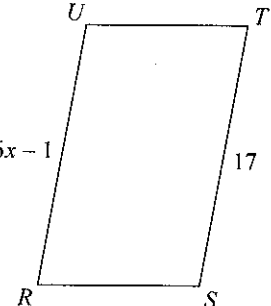
$QT = 3(7) + 15 = 36$

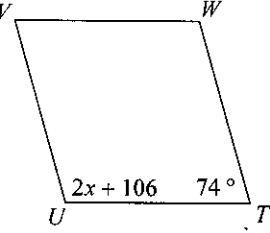
Parallelograms (the basics)

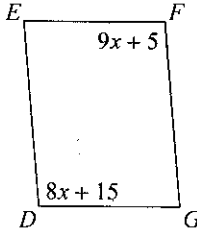
Solve for x . Each figure is a parallelogram.

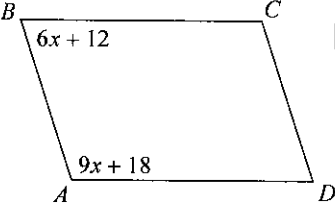
1)  $115 + -5x + 7x = 180$
 $115 + 2x = 180$
 $x = 10$

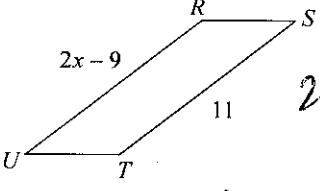
2)  $x - 6 = 2x - 18$
 $x = 12$

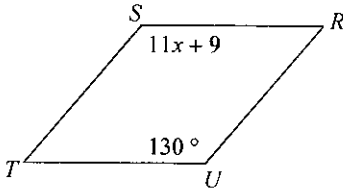
3)  $6x - 1 = 17$
 $x = 3$

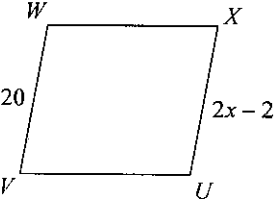
4)  $2x + 106 + 74 = 180$
 $x = 0$

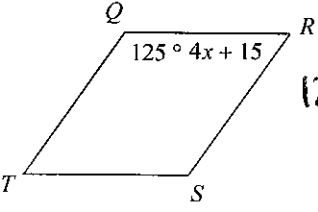
5)  $9x + 5 = 8x + 15$
 $x = 10$

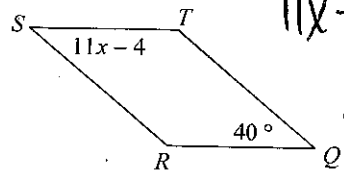
6)  $6x + 12 + 9x + 18 = 180$
 $x = 10$

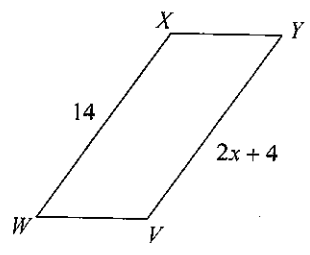
7)  $2x - 9 = 11$
 $x = 10$

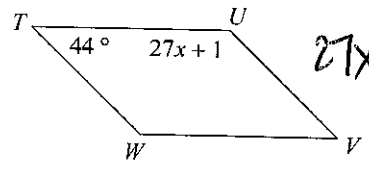
8)  $11x + 9 = 130$
 $x = 11$

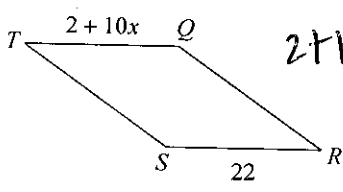
9)  $20 = 2x - 2$
 $x = 11$

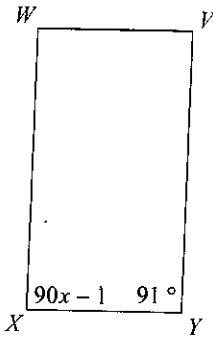
10)  $125 + 4x + 15 = 180$
 $x = 10$

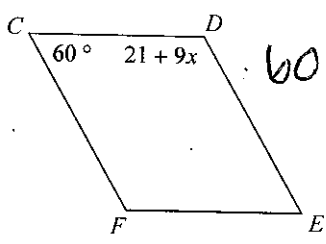
11)  $11x - 4 = 40$
 $x = 4$

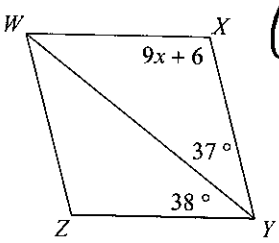
12)  $2x + 4 = 14$
 $x = 5$

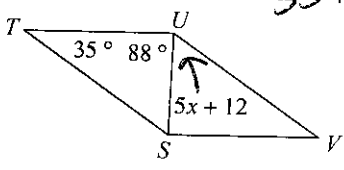
13)  $27x + 1 + 44 = 180$

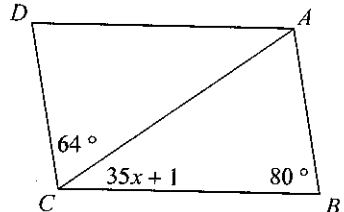
14)  $2 + 10x = 22$
 $x = 2$

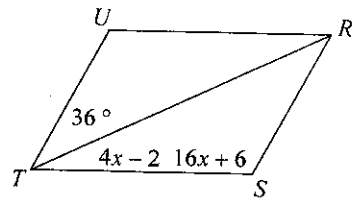
15)  $90x - 1 + 91 = 180$
 $x = 1$

16)  $60 + 21 + 9x = 180$
 $x = 11$

17)  $(37 + 38)$
 $75 + 9x + 6 = 180$
 $x = 11$

18)  $35 + 88 + 5x + 12 = 180$
 $x = 9$

19)  $35x + 64 + 80 = 180$
 $x = 1$

20)  $4x - 2 + 16x + 6 = 180$
 $x = 7$