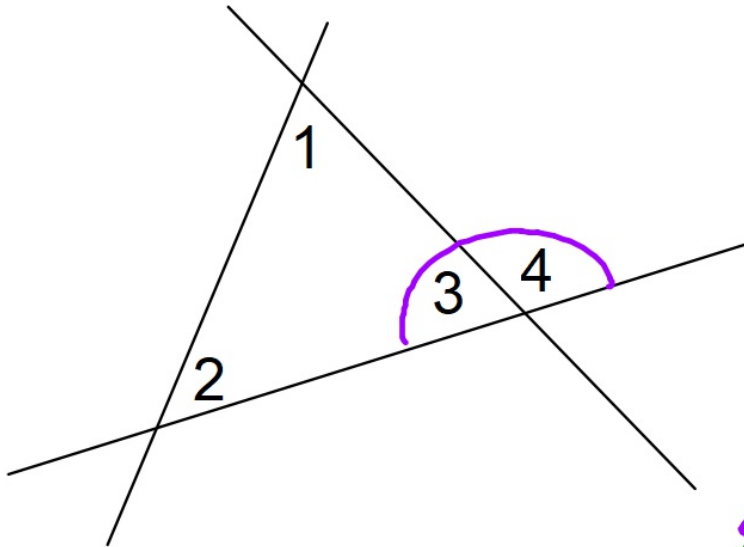


Good morning: warm up in notebooks

Prove that

$$\angle 1 + \angle 2 = \angle 4$$



$$\underline{\angle 1 + \angle 2 + \angle 3 = 180^\circ}$$

(triangle angle sum theorem)

$$\underline{\angle 3 + \angle 4 = 180^\circ}$$

(Linear Pair)

$$\angle 1 + \angle 2 + \cancel{\angle 3} = \cancel{\angle 3} + \angle 4$$

(transitive property)

$$\underline{-\cancel{\angle 3} \quad -\cancel{\angle 3}} \quad \text{(Subtraction)}$$

$$\angle 1 + \angle 2 = \angle 4$$

Q.E.D.

NEED  
TEXTBOOK  
TODAY

also 4 col  
pencils or  
markers  
(grab from  
back table)

A → B  
B → C  
∴ A → C

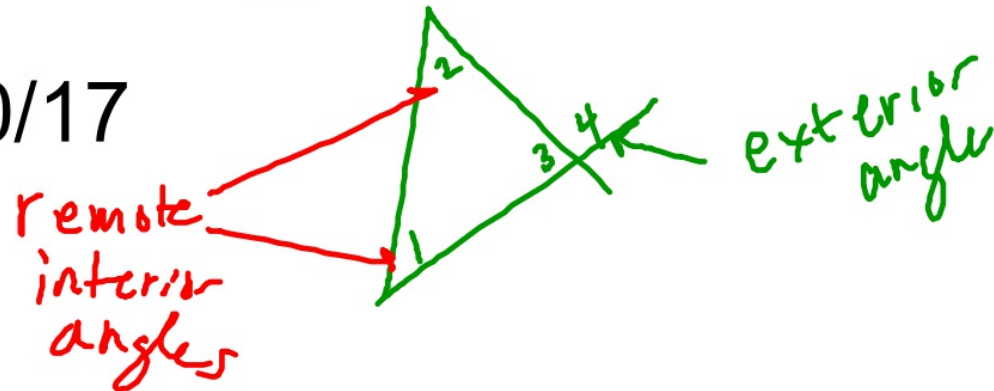
reminders: next assessment is Monday

(add to theorem booklets)

## Exterior Angle Theorem:

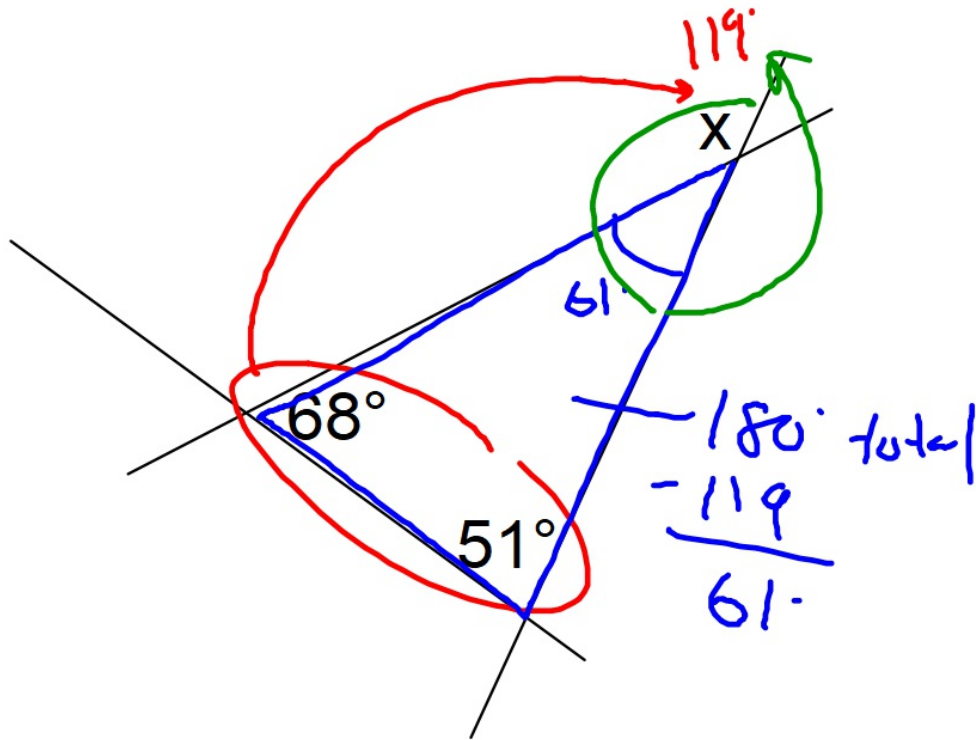
An exterior angle of a triangle is equal in size to the sum of the 2 remote interior angles.

PROVED: 11/30/17



# Visibly Random Grouping

Find the value of x.



# Kites and Trapezoids

What is a kite?

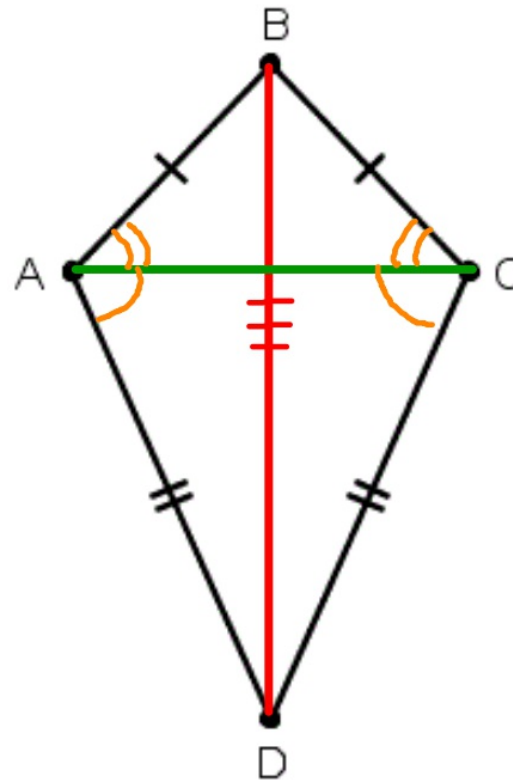
2 distinct pairs of  $\cong$  adj. sides


Think:

Why is  $\angle A = \angle C$ ?

SSS  $\rightarrow$  CPCTC

What kind of triangles  
are  $\triangle ABC$  and  $\triangle ADC$ ?



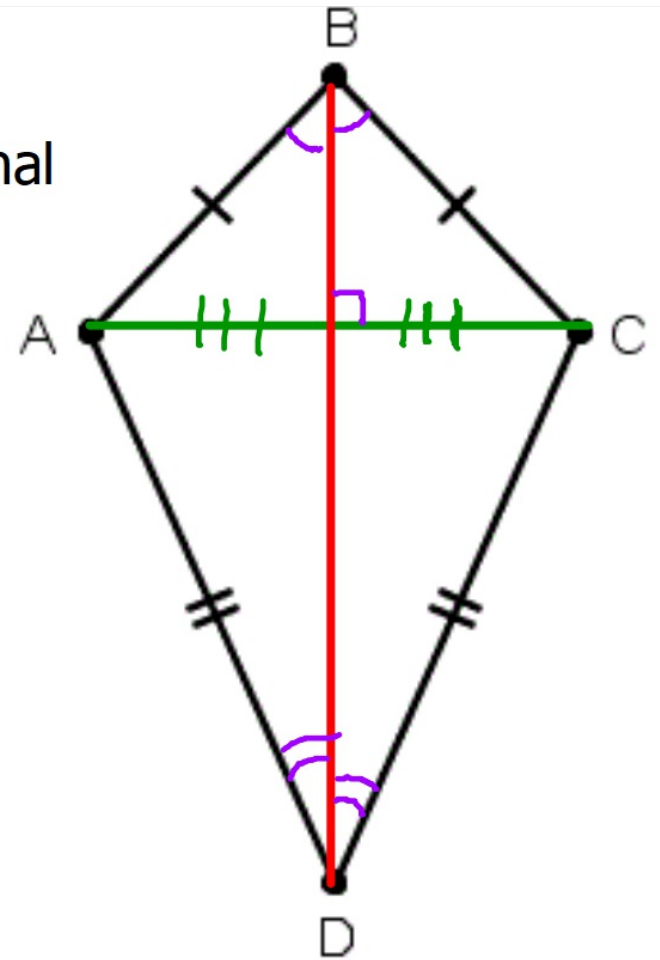
Key facts about kites: 

- long diagonal is perp. bisector of short diagonal
- long diagonal is an angle bisector

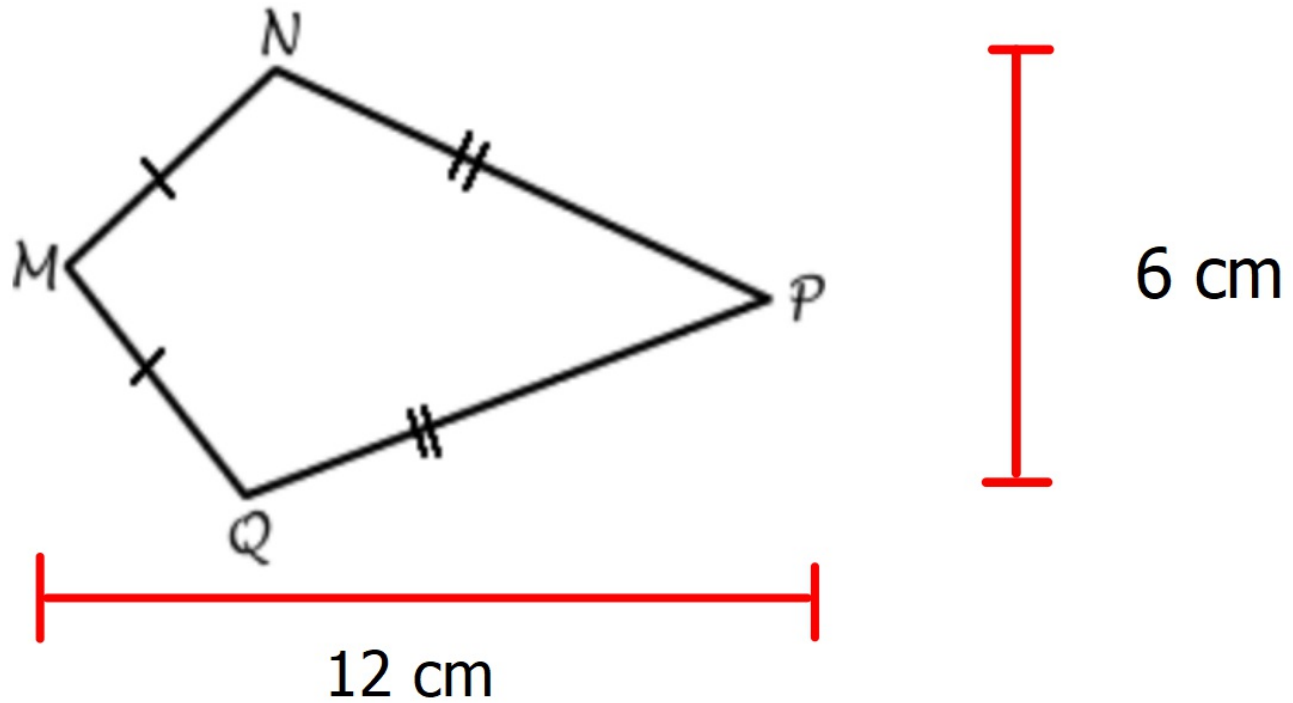


  
Kites In The Sky  
Kite Making Kits For Everyone - KiteKits.com

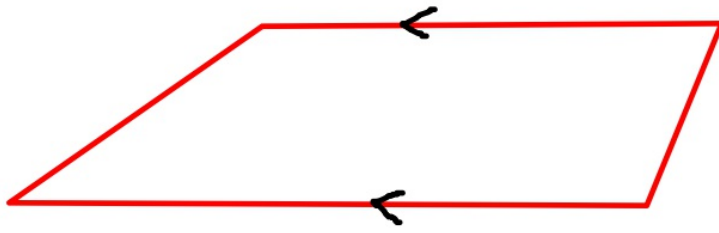
**Diamond**



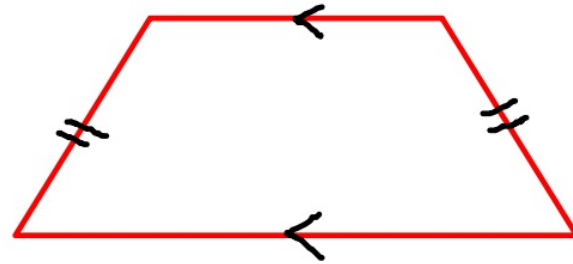
Find the area of the kite.



# Trapezoids



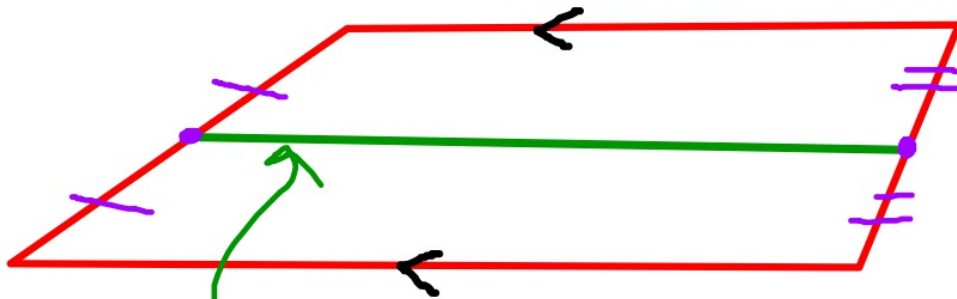
trapezoid



isosceles  
trapezoid

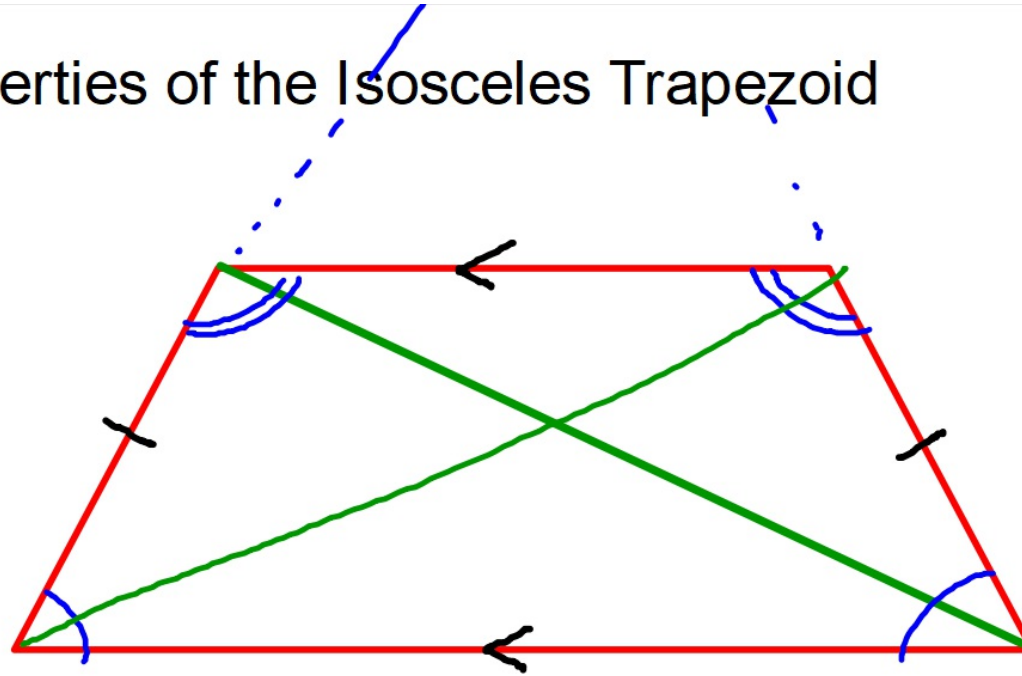


## Trapezoid Midsegment



Midsegment:  $\rightarrow$  parallel to the bases  
 $\rightarrow$  length = avg of the bases

## Special properties of the Isosceles Trapezoid



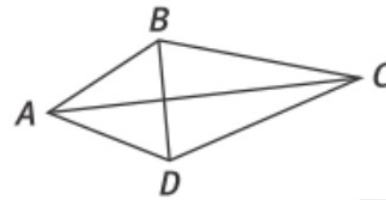
diagonals  
are  $\parallel$

# Kites

p. 208 #12

12. **Make sense of problems.** Figure  $ABCD$  is a kite with diagonals  $\overline{BD}$  and  $\overline{AC}$ . Complete each statement.

$\overline{BD} \perp \underline{\overline{AC}}$   
 $\triangle ABC \cong \triangle \underline{ADC}$   
 $\angle ABC \cong \angle \underline{ADC}$   
 $\overline{AB} \cong \underline{\overline{AD}}$   
 $\angle BAC \cong \angle \underline{DAC}$

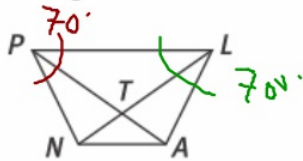


# Trapezoids

p. 212 #10, 11



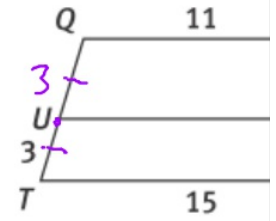
10. Given quad  $PLAN$  is an isosceles trapezoid, use the diagram below and the properties of isosceles trapezoids to find each of the following.

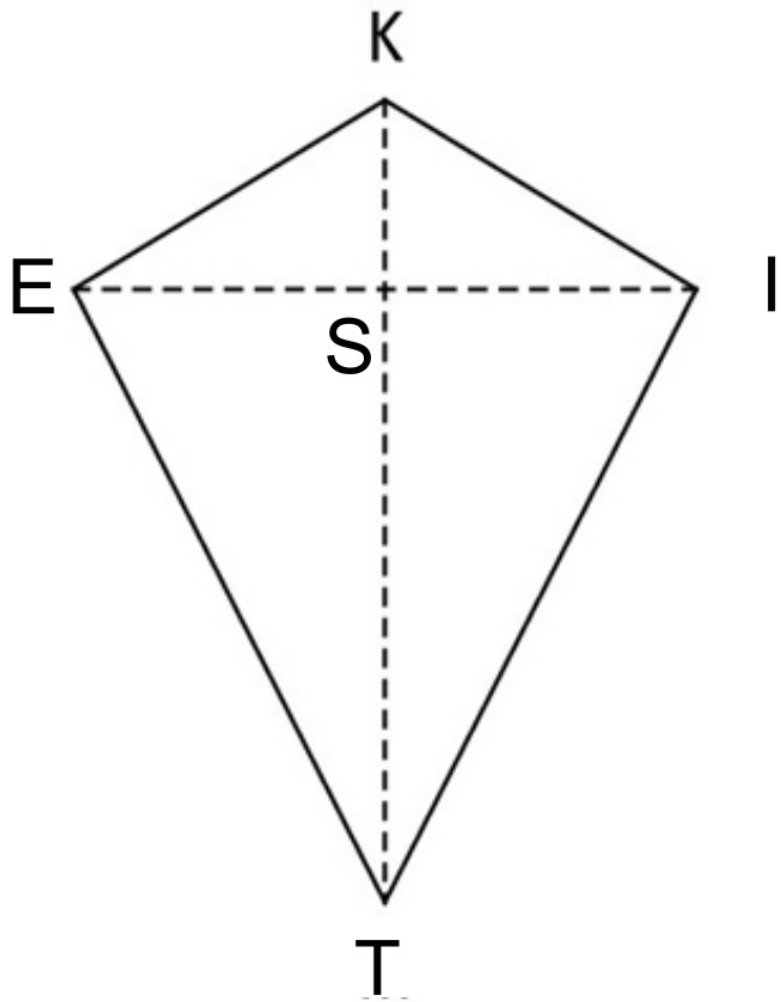


- a.  $\angle LPN \cong \underline{\angle PLA}$   
 b. If  $m\angle PLA = 70^\circ$ , then  $m\angle LPN = \underline{70^\circ}$  and  $m\angle PNA = \underline{110^\circ}$  ★  
 c. Write an equation and solve for  $x$  if  $AP = x$  and  $NL = 3x - 8$ .  
 $x = 4$

11.  $UV$  is a ~~median~~ <sup>midsegment</sup> of trapezoid  $QRST$ . Find each measure.

$QU = \underline{3}$   
 $VS = \underline{4}$   
 $UV = \underline{13}$

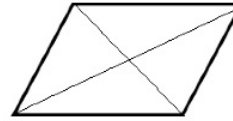




# Parallelograms

Everyone will need  
4 distinct colors

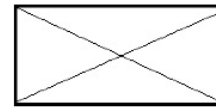
## Parallelograms



□ Def: A quadrilateral with 2 pairs of parallel sides

### Properties

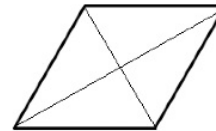
- Opposite sides congruent
- Opposite angles congruent
- Consecutive angles supplementary
- Diagonals bisect each other



□ Def: A quadrilateral with 4 right angles

### Properties

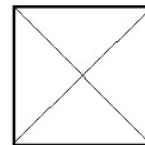
- All parallelogram properties apply
- Diagonals are congruent



□ Def: A quadrilateral with 4 congruent sides

### Properties

- All parallelogram properties apply
- Diagonals are perpendicular
- Diagonals are angle bisectors



□ Def: A quadrilateral with 4 congruent sides and 4 right angles

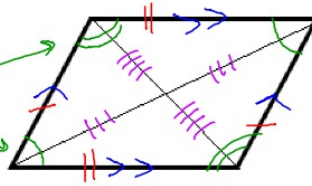
### Properties

- A square is a parallelogram, rectangle, and rhombus simultaneously, so all above properties apply.

# Parallelograms



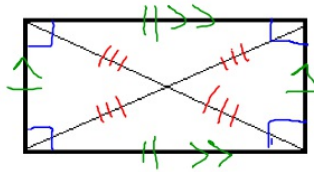
make 180°



■ Def: A quadrilateral with 2 pairs of parallel sides

Properties

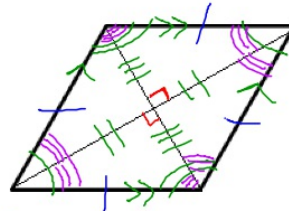
- Opposite sides congruent
- Opposite angles congruent
- Consecutive angles supplementary
- Diagonals bisect each other



■ Def: A quadrilateral with 4 right angles

Properties

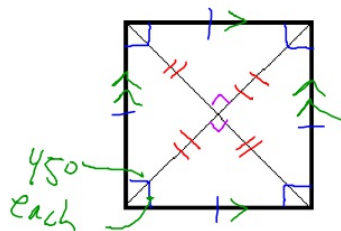
- All parallelogram properties apply
- Diagonals are congruent



■ Def: A quadrilateral with 4 congruent sides

Properties

- All parallelogram properties apply
- Diagonals are perpendicular
- Diagonals are angle bisectors



45° each

■ Def: A quadrilateral with 4 congruent sides and 4 right angles

Properties

- A square is a parallelogram, rectangle, and rhombus simultaneously, so all above properties apply.

# Parallelogram Practice: p. 215# 11, 12

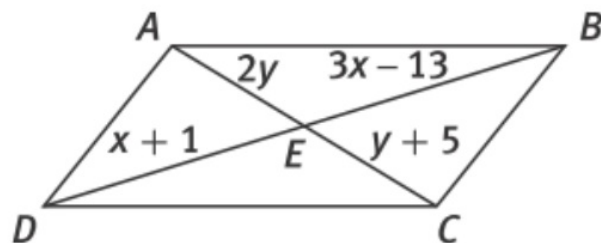
11.  $\overline{AC}$  and  $\overline{DB}$  are diagonals of parallelogram  $ABCD$ . Find each measure.

$AE =$  \_\_\_\_\_

$EC =$  \_\_\_\_\_

$DE =$  \_\_\_\_\_

$EB =$  \_\_\_\_\_



12. **Make sense of problems.** One of the floor tiles that Mr. Cortez sells is shaped like a parallelogram. Find each measure of the floor tile.

$m\angle W =$  \_\_\_\_\_

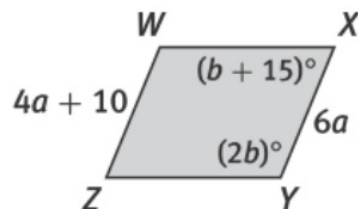
$m\angle X =$  \_\_\_\_\_

$m\angle Y =$  \_\_\_\_\_

$m\angle Z =$  \_\_\_\_\_

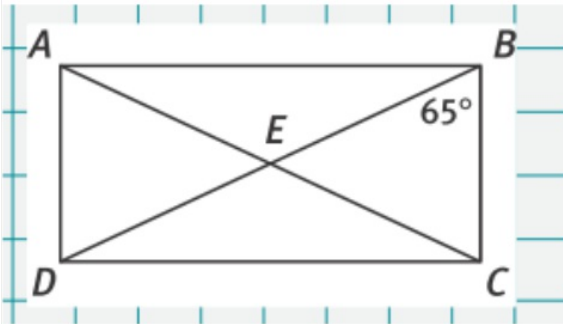
$WZ =$  \_\_\_\_\_

$XY =$  \_\_\_\_\_



p.220 #18, 20, 21

18. Tell whether each statement is true or false.
- All squares are rectangles.
  - All rhombuses are squares.
  - All squares are parallelograms.
  - Some squares are kites.
  - No rhombuses are trapezoids.



20.  $\overline{AC}$  and  $\overline{DB}$  are diagonals of rectangle ABCD. Find each measure.

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

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

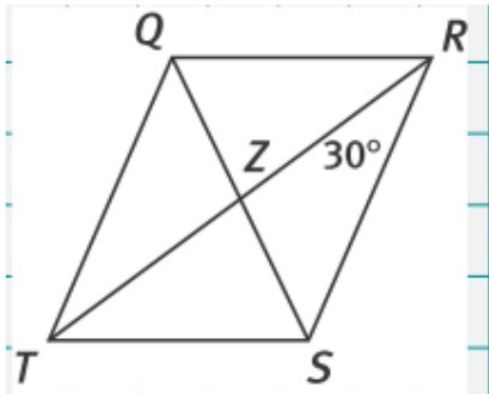
$$m\angle ADC = \underline{\hspace{2cm}}$$

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

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

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

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



21.  $\overline{QS}$  and  $\overline{RT}$  are diagonals of rhombus QRST. Find each measure.

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

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

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

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

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

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



Practice assessment:

old skill:

- SRT-B5a: proofs, fill in the blanks

new skills:

- CO-C10a: applying properties of triangles
- CO-C11a: Parallelograms
- CO-C11b: More Parallelograms



**DON'T**  
copy the solution guide  
mindlessly



**DO**  
try it on your own,  
make mistakes, learn from  
the solution guide

Calculus: if your grade is below your liking, do a retake!

otherwise, work on the p. 174 hw due tomorrow or the p. 183 hw for Monday (we will learn more tomorrow to make it more sensible)

Here for a retake? Know which skill(s) you need and please have the hw for it/them ready to show me please :)