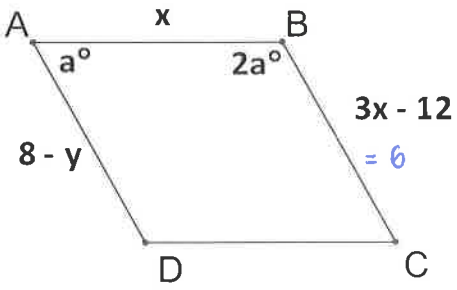
Geometry – A
8.4 & 8.5
Review

Name: Key

Date: _____ Period: ____

Rhombuses :

1. Please find the values of *a*, *x*. and *y* in rhombus ABCD.

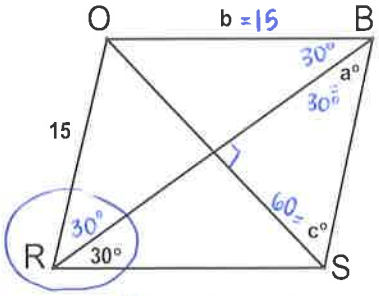


$a+2a=180$ (consec angles are supp.)
$3a=180$
$\boxed{a=60}$

$x=3x-12$ (all sides are ≅)
$-2x=-12$
$\boxed{x=6}$

$8-y=6$ (opp sides are ≅)
$-y=-2$
$\boxed{y=2}$

2. ROBS is a rhombus. Please solve for *a*, *b*, and *c*.

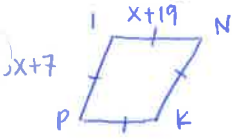


$\boxed{a=30}$ $\boxed{b=15}$

$c=180-30-90$
$\boxed{c=60}$

diagonals bisect angles

3. In rhombus PINK, PI = 3x +7 and IN = x +19, what is the length of $\overline{NK}$?

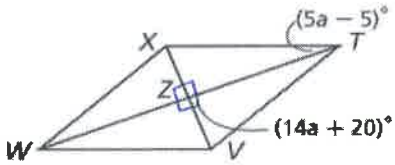


$3x+7=x+19$
$2x=12$
$\boxed{x=6}$

$NK=3(6)+7$
$=18+7$
$\boxed{NK=25}$

4. Quadrilateral TVWX is a rhombus.
   a. Please find m∠TZV.

$\boxed{=90°}$ (diagonals are ⊥)



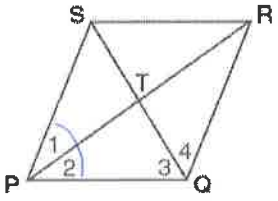
   b. Please find the value of a.

$14a+20=90$ (diagonals are ⊥)
$14a=70$
$\boxed{a=5}$

   c. Please find m∠ZTX.

$=5(5)-5$
$\boxed{=20°}$

5. In the diagram below, PQRS is a rhombus with diagonals $\overline{PR}$ and $\overline{SQ}$. If m∠SPQ= 8x – 14 and m∠1= 3x + 3, then find m∠SPQ.



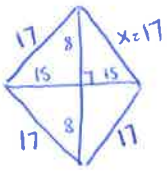
$3x+3+3x+3=8x-14$
$6x+6=8x-14$
$20=2x$
$x=10$

$m\angle SPQ=8(10)-14$
$=80-14$
$\boxed{=66°}$

$m\angle 1+m\angle 2=8x-14$

↳ diagonals are ⊥; use Pythag Thm to find side lengths

6. The diagonals of a rhombus have lengths of 16 and 30. Please find the perimeter of the rhombus.



$8^2+15^2=x^2$

$64+225=x^2$

$289=x^2$

$x=17$

$P=4(17)$

$P=68$

Rectangles and Squares :

7. In rectangle ABCD, AB = 7x – 3, BC = 2, and CD = 4x + 9. Please sketch rectangle ABCD and find the perimeter.

$7x-3=4x+9$

$3x=12$

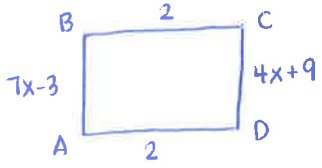
$x=4$

$AB=7(4)-3$

$=25$

$P=25+25+4$

$P=54$



8. ABCD is a rectangle and $m\angle B=(8x+26)°$. What is the value of x?

↑ all angles in a rectangle are 90°

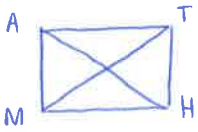
$8x+26=90$

$8x=64$

$x=8$

9. In rectangle MATH, diagonal MT = 2x +12 and diagonal AH = 3x +2. What is the length of $\overline{MT}$?

↳ diagonals are ≅



$2x+12=3x+2$

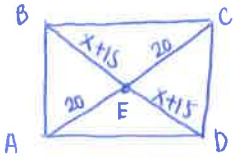
$10=x$

$MT=2(10)+12$

$=20+12$

$MT=32$

10. In rectangle ABCD, diagonals $\overline{AC}$ and $\overline{BD}$ intersect at point E. If AE = 20 and BE = x + 15, please solve for x.



$40=2x+30$

$10=2x$

$x=5$

11. In the diagram to the right, DEFG is a square with diagonals $\overline{GE}$ and $\overline{DF}$.

a. If DE = 5x – 14 and EF = 3x – 6, please solve for x.

$5x-14=3x-6$ (all sides are ≅)

$2x=8$

$x=4$

b. If DF = 2y – 17 and GE = 28 – 3y, please find the value of y.

↳ diagonals are ≅

$2y-17=28-3y$

$5y=45$

$y=9$

c. What is the m∠4?

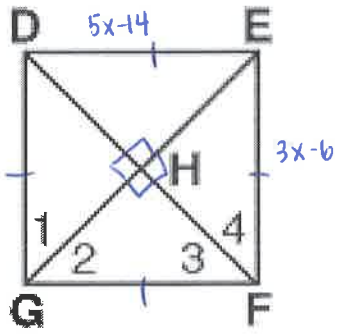
45° (diagonals bisect angles)

d. If m∠DHE = (6x + 18)°, please solve for x.

$6x+18=90$ (diagonals are ⊥)

$6x=72$

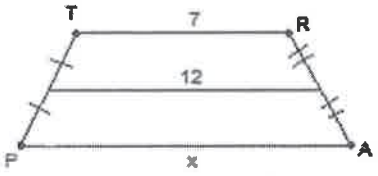
$x=12$



Trapezoids :

The following quadrilaterals are trapezoids. Please solve for the variable. midseg = $\frac{1}{2}$ (base + base)

12.

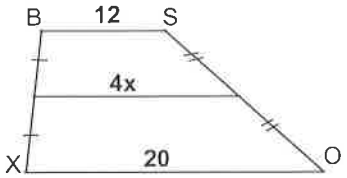


$12 = \frac{1}{2}(7+x)$

$24 = 7 + x$

$\boxed{x = 17}$

13.



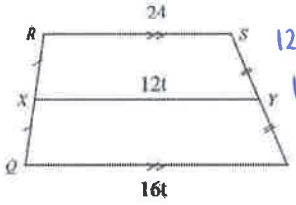
$4x = \frac{1}{2}(12+20)$

$4x = \frac{1}{2}(32)$

$4x = 16$

$\boxed{x = 4}$

14.



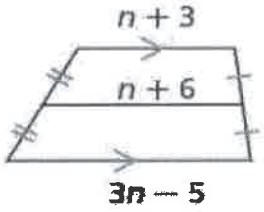
$12t = \frac{1}{2}(24+16t)$

$12t = 12 + 8t$

$4t = 12$

$\boxed{t = 3}$

15.



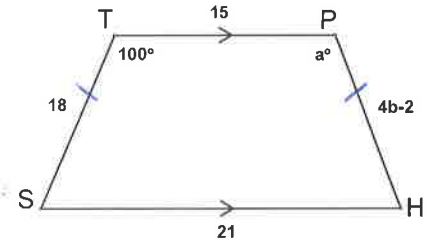
$n+6 = \frac{1}{2}(n+3+3n-5)$

$n+6 = \frac{1}{2}(4n-2)$

$n+6 = 2n-1$

$\boxed{7 = n}$

16. STPH is an isosceles trapezoid. Please solve for *a* and *b*.



$4b-2 = 18$ ← legs are ≅

$4b = 20$

$\boxed{b = 5}$

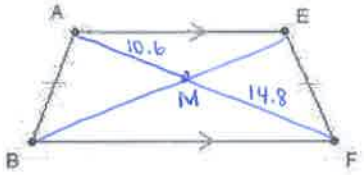
$\boxed{a = 100}$ ← base angles are ≅

17. In quadrilateral ABFE, the diagonals intersect at point M. If AM = 10.6 and FM = 14.8. Please find the length of diagonal BE.

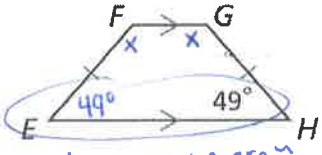
$AF = 10.6 + 14.8$

$AF = 25.4$

$\boxed{BE = 25.4}$



18. Please find the measures of **all** missing angles in the following quadrilateral.



base angles are ≅

$m\angle E = 49°$

$m\angle F = 180 - 49 = 131°$

$m\angle G = 131°$

OR

$x + x + 49 + 49 = 360$

$2x + 98 = 360$

$2x = 262$

$x = 131$

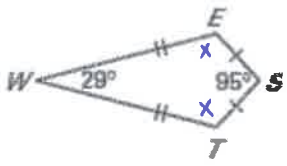
SO

$\boxed{m\angle F = 131°}$

$\boxed{m\angle G = 131°}$

Kites :

19. WEST is a kite. Please find $m\angle E$ and $m\angle T$.



$360-95-29 = 236 \div 2 = 118^\circ$ OR $x+x+95+29=360$

$2x+124=360$

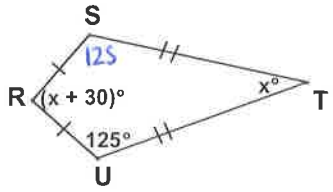
$2x=236$

$x=118$

$m\angle E = 118^\circ$

$m\angle T = 118^\circ$

20. Given that RSTU is a kite, please find $m\angle R$.



$125+125+2x+30=360$

$2x+280=360$

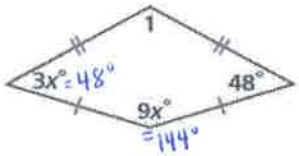
$2x=80$

$x=40$

$m\angle R = 40+30$

$m\angle R = 70^\circ$

21. Please solve for x and find the m∠1.



$3x=48$

$x=16$

$x+48+144+48=360$

$x+240=360$

$x=120$

$m\angle 1 = 120^\circ$

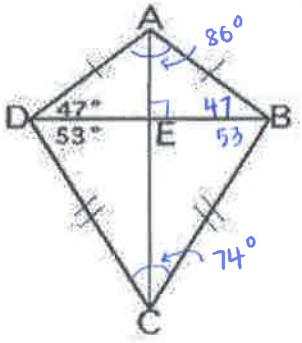
22. Given kite ABCD, please find

a. m∠ABC = 100°

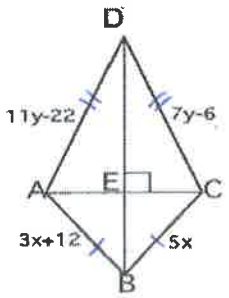
b. m∠CED = 90°

c. m∠DAB = 86°

d. m∠DCB = 74°



23. Given kite DCBA, please solve for x and y.



$3x+12=5x$

$12=2x$

$x=6$

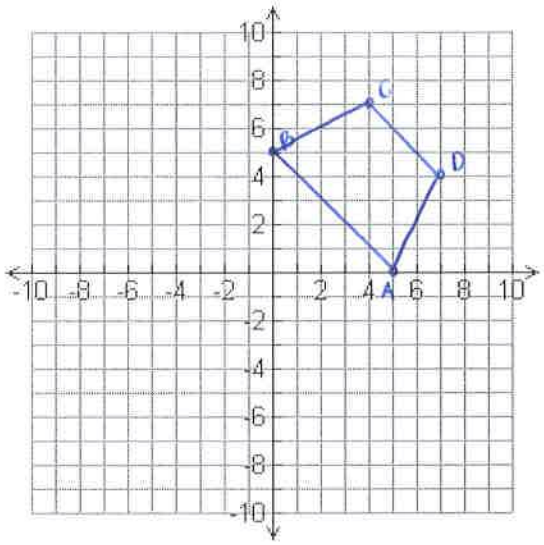
$11y-22=7y-6$

$4y=16$

$y=4$

Coordinate Proofs!

24. Determine if *ABCD* is an isosceles trapezoid using the slope and distance formulas as needed. The coordinates of *ABCD* are A(5, 0), B(0, 5), C(4, 7) and D(7, 4).



Bases

$m_{\overline{CD}} = \frac{4-7}{7-4} = \frac{-3}{3} = -1$

$m_{\overline{AB}} = \frac{5-0}{0-5} = \frac{5}{-5} = -1$

$\rightarrow \overline{CD} \parallel \overline{AB}$

Legs

$CB = \sqrt{(4-0)^2+(7-5)^2} = \sqrt{16+4} = \sqrt{20}$

$AD = \sqrt{(7-5)^2+(4-0)^2} = \sqrt{4+16} = \sqrt{20}$

$\rightarrow \overline{CB} \cong \overline{AD}$

Since $\overline{CD} \parallel \overline{AB}$, one pair of sides are parallel

Since $\overline{CB} \cong \overline{AD}$, one pair of opp sides are congruent

So ABCD is an isosceles trapezoid