Geometry G
6.4 Homework Worksheet

1. Quadrilateral ABCD has vertices A (-3, 2), B (-2, 7), C (2, 4), and D (1, -1). Justify that quadrilateral ABCD is a parallelogram.
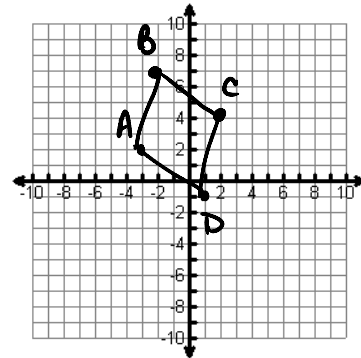
$AB = \dfrac{7-2}{-2+3} = \dfrac{5}{1}$ $BC = \dfrac{7-4}{-2-2} = \dfrac{3}{-4}$

$CD = \dfrac{4+1}{2-1} = \dfrac{5}{1}$ $AD = \dfrac{2+1}{-3-1} = \dfrac{3}{-4}$

Both pairs of opp sides are ∥
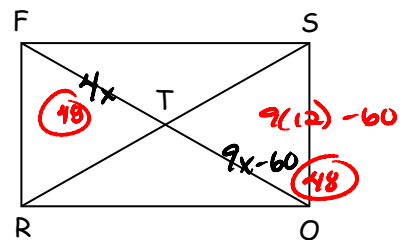
2. Given: FROS is a rectangle
        FT = 4x
        TO = 9x – 60
   Find: RS

   $RS = 96$

   $4x = 9x - 60$
   $\underline{-9x \quad -9x}$
   $\dfrac{-5x}{-5} = \dfrac{-60}{-5}$

   $x = 12$

   4x
   48
   9(12) – 60
   9x – 60
   48

3. What is the value of x if SNOW is a rectangle?

   $42 + 2x + 6 = 90$
   $48 + 2x = 90$
   $\underline{-48 \qquad -48}$
   $\dfrac{2x}{2} = \dfrac{42}{2}$

   $x = 21$

   42°
   (2x + 6)°
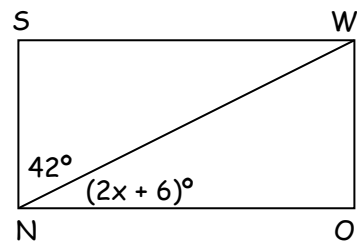
4. Given: CANE is a rectangle
        AS = 5x + 2
        NS = 7x – 6
   Find: CS

   $5x + 2 = 7x - 6$
   $\underline{-5x \qquad -5x}$
   $2 = 2x - 6$
   $\underline{+6 \qquad +6}$

   $\dfrac{8}{2} = \dfrac{2x}{2}$

   $4 = x$

   $CS = 22$

   5(4)+2
   5x+2
   22
   7(4)–6
   7x–6
   22
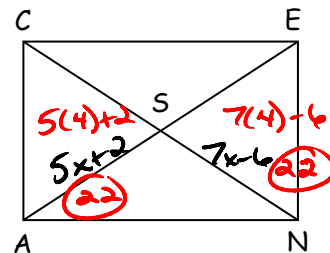
5. Is it true that "If two sides of a quadrilateral are perpendicular, then the quadrilateral is a rectangle?" If not, draw a counter example.
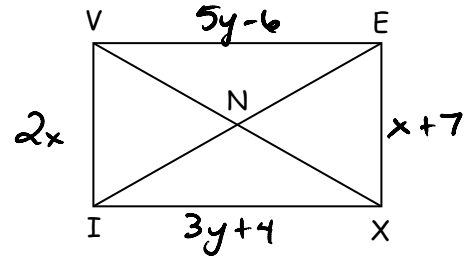
   no

6. Given: VIXE is a rectangle, VI = 2x
   EX = x + 7, VE =5y – 6, IX = 3y + 4
   Solve for x and y.

$2x = x+7$

$\underline{-x \quad -x}$

$\boxed{x = 7}$

$5y-6 = 3y+4$

$\underline{-3y \quad -3y}$

$2y-6=4$

$\underline{+6 \quad +6}$

$\dfrac{2y}{2} = \dfrac{10}{2}$

$\boxed{y=5}$

Figure (rectangle VIXE): V, E top; I, X bottom; diagonals meet at N. Top side $5y-6$, left side $2x$, right side $x+7$, bottom side $3y+4$.

7. If CUPI is a rectangle and m∠1 = 32°, find the m∠2, m∠3, m∠4.

$m\angle 2 = 32°$

$m\angle 3 = 58°$

$m\angle 4 = 58°$

Figure (rectangle CUPI): C top-left, I top-right, U bottom-left, P bottom-right; diagonals meet at D. Angle 4 at I, angles: 1 = 32°, 32, 3, 2; $\begin{array}{c}90 \\ -32\end{array}$
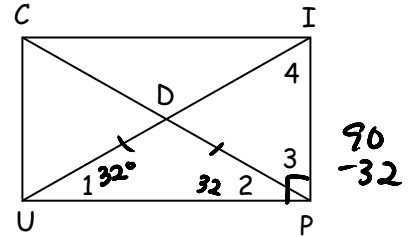
8. a. Given: QRST is a rhombus
       $m\angle 3 = 6x+6$
       Find: x

   $6x+6 = 90$

   $\underline{-6 \quad -6}$

   $\dfrac{6x}{6} = \dfrac{84}{6}$

   $\boxed{x=14}$
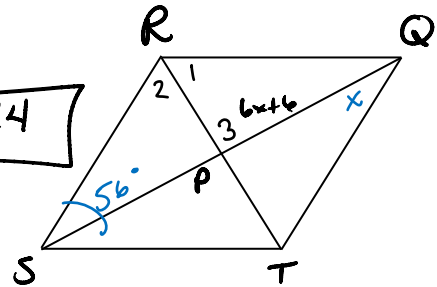
   b. Given: QRST is a rhombus
       $m\angle RST = 56$
       Find: $m\angle TQS$

   $\dfrac{56}{2} = \boxed{28°}$

Figure (rhombus QRST): R top-left, Q top-right, S bottom-left, T bottom-right; diagonals meet at P. Angles 1, 2 at top near R, angle 3 = 6x+6, x, 56°.

9. Given: Rhombus RHOM
       $RH = 2x+3$
       $HO = 5x$
   Find: a. x   1

       b. RM 5

       c. m∠RBH 90°

       d. m∠HOM if m∠RHO = 83.2   96.8°

   $2x+3 = 5x$

   $3 = 3x$

   $1 = x$

Figure (rhombus RHOM): R top-left, H top-right, M bottom-left, O bottom-right; diagonals meet at B. Top side $2x+3$, 83.2, right side $5x$.