

KEY

1. The sum of the interior angle measures of a convex dodecagon.

$$\begin{aligned} (n-2) 180 \\ (12-2) 180 \\ (10) 180 = \boxed{1800^\circ} \end{aligned}$$

2. The measure of each interior angle of a regular nonagon.

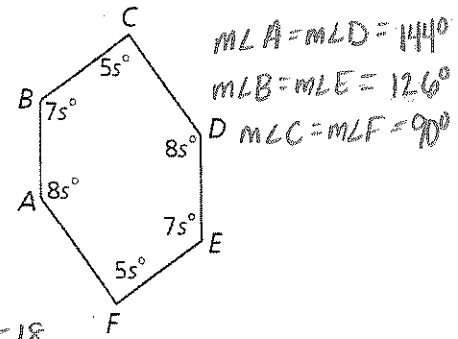
$$\begin{aligned} (n-2) 180 \\ (9-2) 180 \\ 7(180) = 1260 \end{aligned} \qquad \frac{1260}{9} = \boxed{140^\circ}$$

3. The measure of each exterior angle of a regular heptagon.

$$\frac{360}{7} = \boxed{51.4^\circ}$$

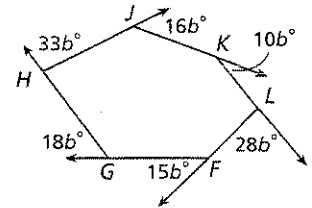
4. Use the figure. Find the measure of each interior angle of hexagon ABCDEF.

$$\begin{aligned} (6-2) 180 = 720^\circ \qquad 8s + 7s + 5s + 8s + 7s + 5s = 720 \\ 40s = 720 \\ \frac{40s}{40} = \frac{720}{40} \qquad s = 18 \end{aligned}$$



5. Find the measure of b in figure FGHL. Then, find the measure of angle LFG.

$$\begin{aligned} 33b + 16b + 10b + 28b + 15b + 18b = 360 \\ 120b = 360 \\ \frac{120b}{120} = \frac{360}{120} \qquad \boxed{b=3} \end{aligned} \qquad \begin{aligned} m\angle LFG = 180 - (15)(3) \\ \boxed{m\angle LFG = 135^\circ} \end{aligned}$$



6. WXYZ is a parallelogram. Find each measure.

a. WX

$$\boxed{WX = 3.5 + 6 = 9.5}$$

b. YZ

$$\boxed{YZ = 9.5}$$

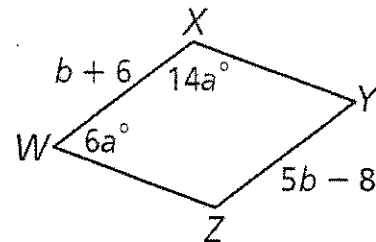
c. angle Y

$$\boxed{m\angle Y = m\angle W = (4)(9) = 36^\circ}$$

c. angle Z

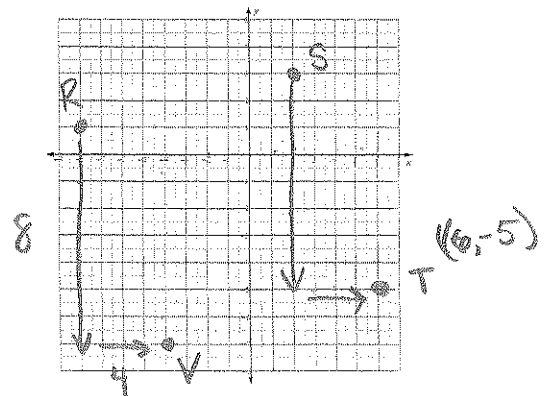
$$\boxed{m\angle Z = m\angle X = 14(9) = 126^\circ}$$

$$\begin{aligned} b+6 &= 5b-8 \\ -b+8 & \quad -b+8 \\ \hline 14 &= 4b \\ \frac{14}{4} &= \frac{4b}{4} \qquad b = 3.5 \\ a+14a &= 180 \\ 20a &= 180 \\ \frac{20a}{20} &= \frac{180}{20} \\ a &= 9 \end{aligned}$$

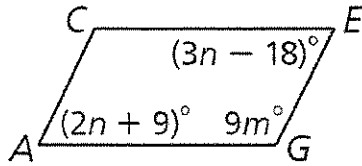


7. Three vertices of  $\square RSTV$  are  $R(-8, 1)$ ,  $S(2, 3)$ , and  $V(-4, -7)$ . Find the coordinates of vertex T.

T (6, -5)



8. Find the measure of angle C.



$$2n + 9 = 3n - 18$$

$$\begin{array}{r} 2n + 9 \\ -2n + 18 \\ \hline 27 = n \end{array}$$

$$m\angle C = 180 - 63$$

$$\boxed{m\angle C = 117^\circ}$$

$$m\angle A = 2(27) + 9 = 63$$

9. Find each measure.

a. angle T

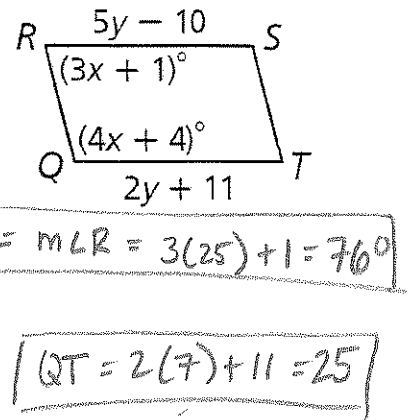
$$3x + 1 + 4x + 4 = 180$$

$$7x + 5 = 180$$

$$\frac{7x}{7} = \frac{175}{7}$$

$$x = 25$$

b. QT



$$5y - 10 = 2y + 11$$

$$\begin{array}{r} 5y - 10 \\ -2y + 10 \\ \hline 3y = 21 \\ \frac{3y}{3} = \frac{21}{3} \end{array}$$

$$y = 7$$

10. The measure of the interior angles of a convex quadrilateral are  $2n$ ,  $2n$ ,  $5n$ , and  $6n$ . What is the measure of the largest angle?

$$(n-2) 180$$

$$(4-2) 180$$

$$2(180) = 360$$

$$2n + 2n + 5n + 6n = 360$$

$$\frac{15n}{15} = \frac{360}{15}$$

$$n = 24$$

LARGEST ANGLE is  $6n$   
 $6(24) = \boxed{144^\circ}$

11. In rhombus WXYZ,  $WX = 7a + 1$ ,  $WZ = 9a - 6$ , and  $VZ = 3a$ . Find each measure.

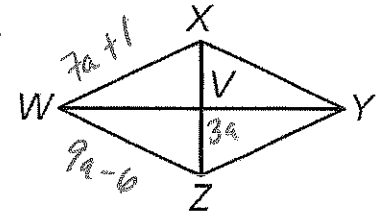
a. WZ

$$\boxed{WZ = 9(3.5) - 6 = 25.5}$$

b. XV

$$XV = VZ = 3(3.5)$$

$$\boxed{XV = 10.5}$$



c. XY

$$\boxed{XY = 25.5}$$

d. XZ

$$XZ = 2(10.5)$$

$$\boxed{XZ = 21}$$

$$7a + 1 = 9a - 6$$

$$\begin{array}{r} -7a + 6 \\ -7a + 6 \\ \hline 7 = 2a \\ \frac{7}{2} = \frac{2a}{2} \end{array}$$

$$3.5 = a$$

12. In rhombus RSTV,  $m\angle TZV = (8n + 18)^\circ$ , and  $m\angle SRV = (9n + 1)^\circ$ .

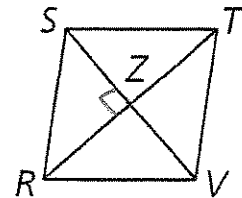
a. Find  $m\angle TRS$

$$m\angle SRV = 9(9) + 1 = 82^\circ$$

$$m\angle TRS = \frac{1}{2}(82) = \boxed{41^\circ}$$
 Rhombus  $\rightarrow$  bisects  $\angle$ 's

b.  $m\angle RSV$

$$180 - 41 - 90 = \boxed{49^\circ}$$



$$8n + 18 = 90^\circ$$

$$\begin{array}{r} -18 \\ -18 \\ \hline 8n = 72 \end{array}$$

$$\frac{8n}{8} = \frac{72}{8}$$

$$n = 9$$

c.  $m\angle STV$

$$m\angle STV = \boxed{82^\circ}$$

d.  $m\angle TVR$

$$m\angle TVR = m\angle TSR$$

$$m\angle TVR = 2(49) = \boxed{98^\circ}$$

Find the measures of the numbered angles in each figure.

13. rectangle  $MNPQ$

$m\angle 1 = 57^\circ$   
 $m\angle 2 = 66^\circ$   
 $m\angle 3 = 33^\circ$   
 $m\angle 4 = 114^\circ$   
 $m\angle 5 = 57^\circ$

14. rhombus  $CDGH$

$m\angle 1 = 53^\circ$   
 $m\angle 2 = 37^\circ$   
 $m\angle 3 = 90^\circ$   
 $m\angle 4 = 37^\circ$   
 $m\angle 5 = 53^\circ$

Find each measure.

15.  $m\angle R$  and  $m\angle S$

$m\angle S = 54^\circ$   
 $m\angle R = 180 - 54 = 126^\circ$

16.  $BZ$  if  $ZH = 70$   
and  $EK = 121.6$

$BZ + ZH = EK$   
 $BZ + 70 = 121.6$   
 $BZ = 51.6$

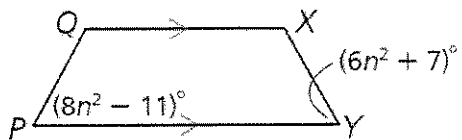
17.  $MN$

$MN = \frac{1}{2}(AD + JG)$   
 $MN = \frac{1}{2}(67 + 30)$   
 $MN = \frac{1}{2}(97) = 48.5$

18.  $EQ$

$ST = \frac{1}{2}(FE + EQ)$   
 $(2)3.1 = \frac{1}{2}(2.7 + EQ)(2)$   
 $6.2 = 2.7 + EQ$   
 $-2.7 -2.7$   
 $3.5 = EQ$

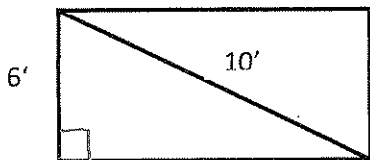
19. Find the value of  $n$  so that  $PQXY$  is isosceles.



$$\begin{array}{r} 8n^2 - 11 = 6n^2 + 7 \\ -6n^2 \quad -6n^2 \\ \hline 2n^2 - 11 = 7 \\ +11 \quad +11 \\ \hline 2n^2 = 18 \\ \frac{2n^2}{2} = \frac{18}{2} \end{array}$$

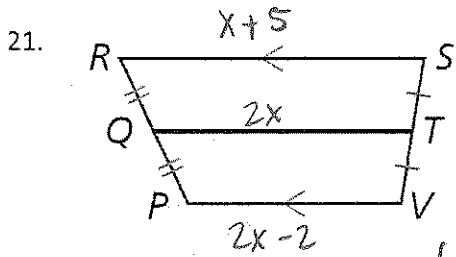
$$\begin{array}{l} \sqrt{n^2 + 9} \\ n = \pm 3 \end{array}$$

20. Find the area of the rectangle.



$$\begin{array}{l} a^2 + b^2 = c^2 \\ 6^2 + b^2 = 10^2 \\ 36 + b^2 = 100 \\ -36 \quad -36 \\ \hline b^2 = 64 \\ b = 8 \end{array}$$

$$\begin{array}{l} A = bh \\ A = 6(8) = 48 \text{ ft}^2 \end{array}$$



If  $RS = x+5$ ,  $QT = 2x$ , and  $PV = 2x - 2$ , find the length of  $RS$ .

$$QT = \frac{1}{2}(RS + PV) \quad RS = 3 + 5 = 8$$

$$2x = \frac{1}{2}(x+5 + 2x-2)$$

$$(2) 2x = \frac{1}{2}(3x+3)(2)$$

$$4x = 3x + 3$$

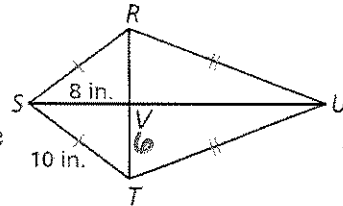
$$\begin{array}{r} 4x \\ -3x \\ \hline x = 3 \end{array}$$

22. Find the area of Triangle RST.

$$\begin{aligned} a^2 + b^2 &= c^2 & \sqrt{b^2} &= \sqrt{36} \\ 8^2 + b^2 &= 10^2 & b &= 6 \\ 64 + b^2 &= 100 & VT &= 6 \end{aligned}$$

So,  $RT = 12$

$$A_{\Delta} = \frac{1}{2}bh = \frac{1}{2}(12)(8) = 48$$



23. If the length of  $SU$  is 30, find the area of Kite  $RSTU$ .

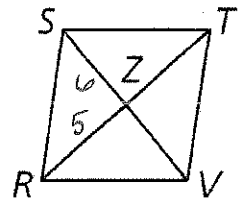
$$A_{\Delta STU} = \frac{1}{2}bh = \frac{1}{2}(30)(6) = 90$$

$$A_{\text{KITE}} = 90(2) = 180$$

24. Given a rhombus with  $SZ = 6$  inches and  $RZ = 5$  inches, find the area of rhombus  $RSTV$ .

$$A_{\Delta RZS} = \frac{1}{2}bh = \frac{1}{2}(6)(5) = 15$$

Rhombus  $\Rightarrow 4 \cong \Delta$ 's, so  $4(15) = \boxed{60 \text{ in}^2}$



25. Find all missing angle measures, given  $ABCD$  and  $EFHG$  are parallelograms. The measure of angle  $D$  is  $55^\circ$  and the measure of angle  $H$  is  $45^\circ$ .

$$m\angle 1 = 55^\circ \text{ (opp. } \angle\text{'s are } \cong\text{)}$$

$$m\angle 2 = 135^\circ$$

$$m\angle 3 = 45^\circ \text{ (opp. } \angle\text{'s } \cong\text{)}$$

$$m\angle 4 = 125^\circ$$

$$m\angle 5 = 135^\circ$$

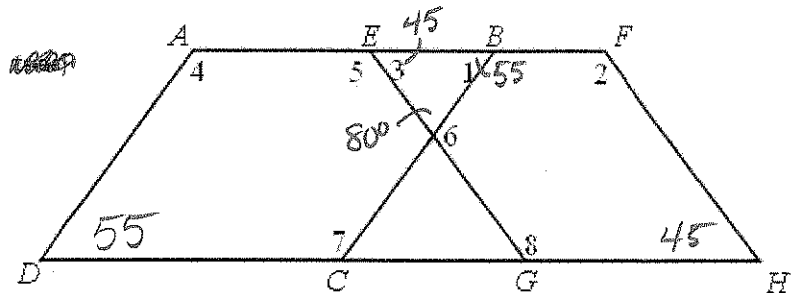
$$m\angle 6 = 100^\circ$$

$$m\angle 7 = 125^\circ$$

$$m\angle 8 = 135^\circ$$

$$m\angle 1 = m\angle D \text{ (opp } \angle\text{'s } \cong \text{ in p-gram)}$$

$$m\angle 3 = m\angle H \text{ (opp } \angle\text{'s } \cong \text{ in p-gram)}$$



$$m\angle 4 = 180 - 55^\circ$$

$$m\angle 6 = 180 - 80 = 100^\circ$$

$$m\angle 2 = 180 - 45 = 135^\circ$$

$$m\angle 7 = m\angle 4 = 125^\circ$$

$$m\angle 5 = 180 - m\angle 3$$

$$m\angle 8 = m\angle 2 = 135^\circ$$

$$180 - 45 = 135^\circ$$