

Geometry Honors
Worksheet – Sections 5-1, 5-2

Name Key

1. Find the measures of the other three angles of a parallelogram if one angle measures

a. 60	<u>60</u>	<u>120</u>	<u>120</u>
b. 68	<u>68</u>	<u>112</u>	<u>112</u>
c. 73	<u>73</u>	<u>107</u>	<u>107</u>
d. 110	<u>110</u>	<u>70</u>	<u>70</u>
e. 138	<u>138</u>	<u>42</u>	<u>42</u>
f. 160	<u>160</u>	<u>20</u>	<u>20</u>

2. In parallelogram ABCD, $m\angle A = x$ and $m\angle B = 2x + 60$.

$$2x + 2(2x + 60) = 360$$

$$6x = 240$$

$m\angle A = \underline{40}$ $m\angle B = \underline{140}$ $m\angle C = \underline{40}$ $m\angle D = \underline{140}$

3. In parallelogram ABCD, $m\angle A = x$ and $m\angle B = 2x - 30$.

$$2x + 2(2x - 30) = 360$$

$$6x - 60 = 360$$

$$6x = 420$$

$m\angle A = \underline{70}$ $m\angle B = \underline{110}$ $m\angle C = \underline{70}$ $m\angle D = \underline{110}$

4. In parallelogram ABCD, the measures of $\angle A$ and $\angle B$ are in the ratio of 2:7.

$$2(2x) + 7(x) = 360$$

$$4x + 14x = 360$$

$$18x = 360$$

$$x = 20$$

$m\angle A = \underline{40}$ $m\angle B = \underline{140}$ $m\angle C = \underline{40}$ $m\angle D = \underline{140}$

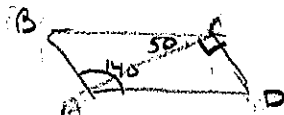
5. In parallelogram ABCD, $m\angle A$ exceeds the $m\angle B$ by 30.

$$2(b + 30) + 2b = 360$$

$$4b = 300$$

$m\angle A = \underline{105}$ $m\angle B = \underline{75}$ $m\angle C = \underline{105}$ $m\angle D = \underline{75}$

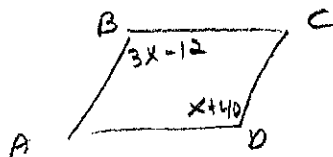
6. In parallelogram ABCD, $\overline{AC} \perp \overline{CD}$. If $m\angle ACB = 50$



$m\angle CDA = \underline{40}$

7. In parallelogram ABCD, $m\angle ABC = 3x - 12$ and $m\angle CDA = x + 40$.

$m\angle DAB = \underline{114}$ $m\angle DCB = \underline{114}$ $m\angle ABC = \underline{600}$ $m\angle CDA = \underline{66}$



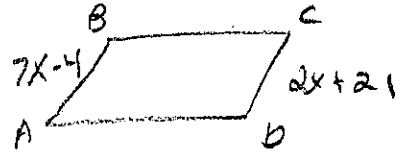
$$3x - 12 = x + 40$$

$$2x = 52$$

$$x = 26$$

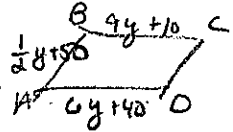
8. In parallelogram ABCD, $AB = 7x - 4$ and $CD = 2x + 21$.

$$\begin{aligned} 7x - 4 &= 2x + 21 \\ 5x &= 25 \\ x &= 5 \end{aligned}$$



$AB = \underline{31}$ $CD = \underline{31}$

9. In parallelogram ABCD, $BC = 9y + 10$, $AD = 6y + 40$, and $AB = \frac{1}{2}y + 50$.

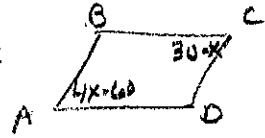


$$\begin{aligned} 9y + 10 &= 6y + 40 \\ 3y &= 30 \\ y &= 10 \end{aligned}$$

$AB = \underline{55}$ $BC = \underline{100}$ $CD = \underline{55}$ $AD = \underline{100}$

10. In parallelogram ABCD, $m\angle DAB = 4x - 60$ and $m\angle DCB = 30 - x$

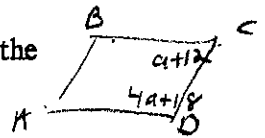
$$\begin{aligned} 4x - 60 &= 30 - x \\ 5x &= 90 \\ x &= 18 \end{aligned}$$



$m\angle DAB = \underline{12}$ $m\angle DCB = \underline{12}$ $m\angle ABC = \underline{168}$ $m\angle CDA = \underline{168}$

11. In parallelogram ABCD, $m\angle DCB = a + 12$ and $m\angle CDA = 4a + 18$. Find the measures of the four angles of the parallelogram.

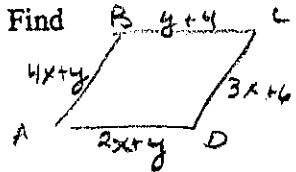
$$\begin{aligned} a + 12 + 4a + 18 &= 180 \\ 5a &= 150 \\ a &= 30 \end{aligned}$$



$m\angle A = \underline{42}$ $m\angle B = \underline{138}$ $m\angle C = \underline{42}$ $m\angle D = \underline{138}$

12. In parallelogram ABCD, $AB = 4x + y$, $BC = y + 4$, $CD = 3x + 6$, $DA = 2x + y$. Find the lengths of the sides of the parallelogram.

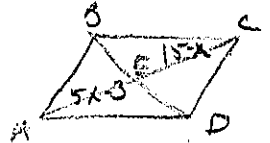
$$\begin{aligned} 2x + y &= y + 4 \rightarrow 2x = 4 \rightarrow x = 2 \\ 4x + y &= 3x + 6 \rightarrow x + y = 6 \\ 2 + y &= 6 \\ y &= 4 \end{aligned}$$



$AB = \underline{12}$ $BC = \underline{8}$ $CD = \underline{12}$ $AD = \underline{8}$

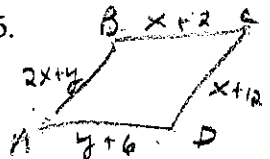
13. In parallelogram ABCD, the diagonals intersect at point E. $AE = 5x - 3$ and $EC = 15 - x$.

$$\begin{aligned} 5x - 3 &= 15 - x \\ 6x &= 12 \\ x &= 2 \end{aligned}$$



$AC = \underline{24}$

14. In parallelogram ABCD, $AB = 2x + y$, $BC = x + 2$, $CD = x + 12$, and $DA = y + 6$.



$x = \underline{8}$ $y = \underline{4}$ $AB = \underline{20}$ $BC = \underline{10}$

$CD = \underline{20}$ $DA = \underline{10}$

$$\begin{aligned} x + 2 &= y + 6 \\ x - y &= 4 \end{aligned}$$

$$\begin{aligned} 2x + y &= x + 12 \\ x + y &= 12 \end{aligned}$$

$$\begin{aligned} x + y &= 12 \\ x - y &= 4 \\ 2x &= 16 \\ x &= 8 \end{aligned}$$

$$\begin{aligned} 8 + y &= 12 \\ y &= 4 \end{aligned}$$