

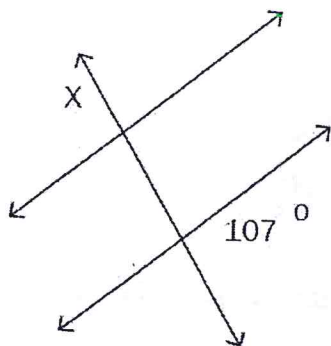
Identifying Angle Pairs Worksheet

Name: Key Class: _____ Date: _____

For each of the following diagrams, find the value for X and explain what the pattern is – please refer to your worksheets and the vocabulary sheets – Please note the correction on Corresponding Angles on the Answer sheet.

Find the value of x.

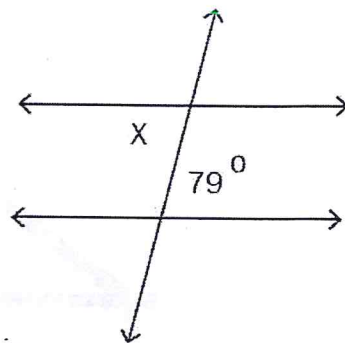
1)



X = 107

Because Exterior alternating (congruent)

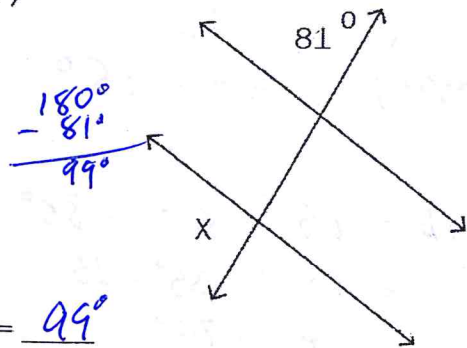
2)



X = 79

Because interior alternating (congruent)

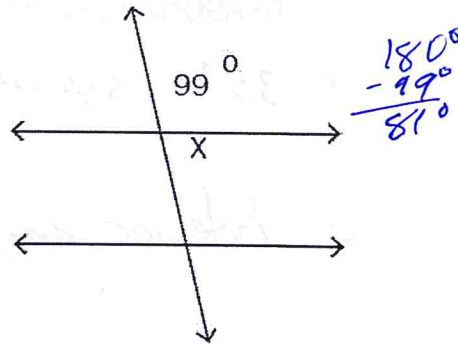
3)



X = 99

Because exterior same side (supplementary)

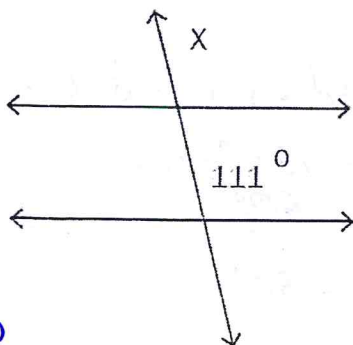
4)



X = 81

Because: adjacent (supplementary)

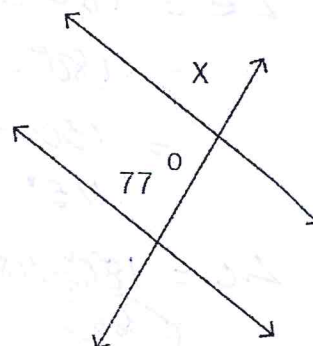
5)



X = 111

Because corresponding angles (congruent)

6)

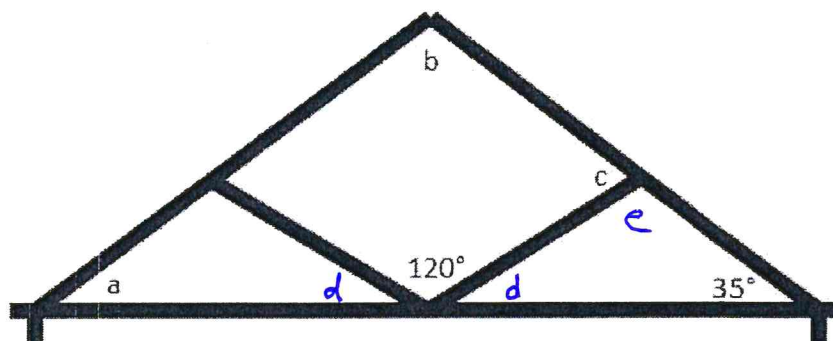


X = 77

Because: corresponding (congruent)

Name: _____ Class: _____ Date: _____

For each of the following diagrams, read the description carefully and then use line/angle reasoning to find the missing angle. Explain and then do any math necessary in the next box.

Finding Angles: Example 1

What are the measures of the angles located at positions a, b, & c? Note: the figure is symmetrical on the vertical through angle b.

REASONING/EXPLANATION

MATH

∠a 35° symmetry (isosceles triangle) $\angle a = 35^\circ$

∠b interior angle sum $\angle b = 180^\circ - \angle a - 35^\circ$
 $= 180^\circ - 35^\circ - 35^\circ$

∠c angle e is adjacent to ∠c $= 180^\circ - 70^\circ$
 $= 110^\circ$

∠e is found by interior angle sum

$$\begin{aligned}\angle e &= 180^\circ - \angle d - 35^\circ \\ &= 180^\circ - 30^\circ - 35^\circ \\ &= 150^\circ - 35^\circ \\ &= 115^\circ\end{aligned}$$

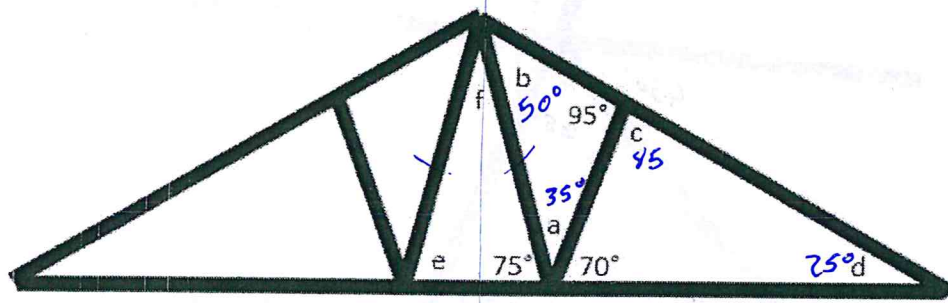
$$\angle c = 180^\circ - 115^\circ$$

65°

angled is found by supplementary

$$\begin{aligned}\angle d &= 180^\circ - 120^\circ \\ \angle d &= 60^\circ \\ \angle d &= 30^\circ\end{aligned}$$

Finding Angles: Example 2



What are the measures of the angles located at positions a, b, c, d, e, & f? Note: the figure is symmetrical on the vertical through angle f.

REASONING/EXPLANATION

MATH

$\angle a$ supplementary to 75° and 70°

$$180^\circ - 145^\circ = 35^\circ$$

$\angle b$ interior angle sum $180 - 95 - 35 = 50^\circ$

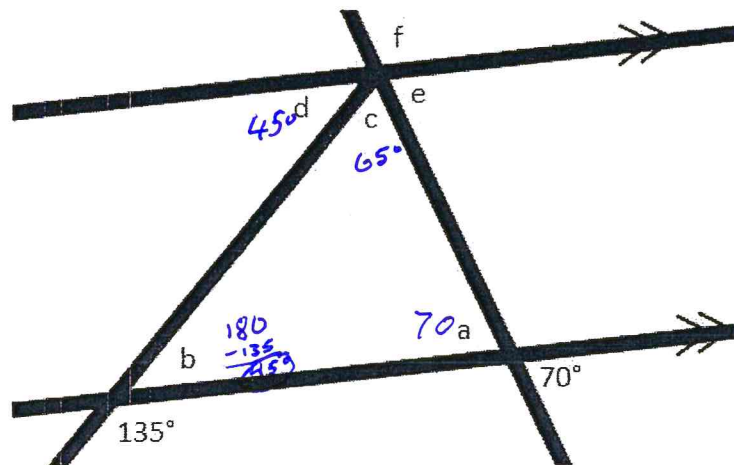
$\angle c$ adjacent angles + supplementary $180 - 95 = 85^\circ$

$\angle d$ interior angle theorem $\angle d = 180^\circ - 85^\circ - 70^\circ = 25^\circ$

$\angle e$ by symmetry isosceles triangle $\angle e = 75^\circ$

$\angle f$ interior angle theorem $\angle f = 180^\circ - 2 \times 75^\circ = 180^\circ - 150^\circ = 30^\circ$

Finding Angles: Example 3



What are the measures of the angles located at positions a, b, c, d, e, & f?

REASONING/EXPLANATION	MATH
$\angle a$ 70° opposite congruent	$= 70^\circ$
$\angle b$ 45° adjacent supplementary $\rightarrow$	$180^\circ - 135^\circ = 45^\circ$
$\angle c$ 65° Interior angle sum (supplementary) $\rightarrow$	$180^\circ - 70^\circ = 110^\circ - 45^\circ = 65^\circ$
$\angle d$ 45° interior alternating to $\angle b \rightarrow$	45°
$\angle e$ supplementary to $\angle c$ and $\angle d \rightarrow$ or corresponding to 70° (congruent) $\rightarrow$	$180^\circ - 45^\circ = 135^\circ - 65^\circ = 70^\circ$ 70°
$\angle f$ exterior same side supplementary $\rightarrow$	$180^\circ - 70^\circ = 110^\circ$