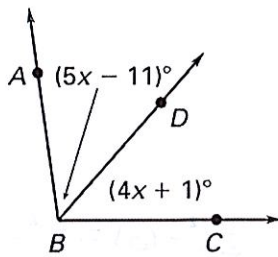


KEY

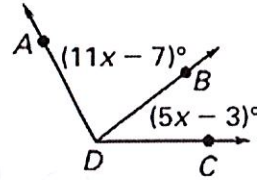
In the diagram \overline{BD} bisects $\angle ABC$. Find $m\angle ABC$.



$$\begin{array}{r} 5x - 11 = 4x + 1 \\ -4x \quad -4x \\ \hline x - 11 = 1 \\ +11 \quad +11 \\ \hline x = 12 \end{array}$$

$m\angle ABC = 5(12) - 11 + 4(12) + 1 = \boxed{98^\circ}$ **1**

Given $m\angle ADC = 118^\circ$, find $m\angle ADB$



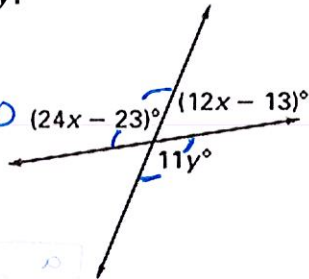
$m\angle ADB = 11(8) - 7 = \boxed{81^\circ}$

$$\begin{array}{r} (11x - 7) + (5x - 3) = 118 \\ 16x - 10 = 118 \\ +10 \quad +10 \\ \hline 16x = 128 \\ \frac{16x}{16} = \frac{128}{16} \\ x = 8 \end{array}$$

2

Find the value of x and y .

$(24x - 23) + (12x - 13) = 180$

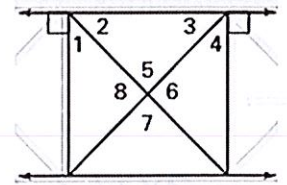


$$\begin{array}{r} 36x - 36 = 180 \\ +36 \quad +36 \\ \hline 36x = 216 \\ \frac{36x}{36} = \frac{216}{36} \\ x = 6 \end{array}$$

because of vertical angles
 $\frac{11y}{11} = \frac{121}{11}$
 $y = 11$ **3**

$24(6) - 23 = 121^\circ$

Using the diagram provided. Describe the relationship between every angle pair. Some may have more than one relationship.



Possible relationships: Adjacent, Supplementary, Vertical, Congruent, Complementary, Linear Pair

- a) $\angle 1$ and $\angle 2$ Adjacent, complementary
- b) $\angle 5$ and $\angle 8$ Adjacent, linear pair, supplementary
- c) $\angle 6$ and $\angle 8$ vertical, congruent

4

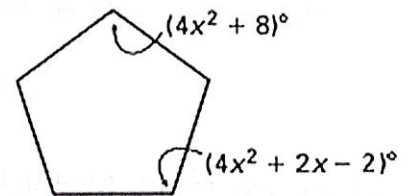
The lengths (in feet) of two sides of a regular quadrilateral are represented by the expressions $8x - 6$ and $4x + 22$. Find the length of a side of the quadrilateral.

Equilateral (sides equal)
 Equiangular (angles equal)

$$\begin{array}{r} 8x - 6 = 4x + 22 \\ -4x \quad -4x \\ \hline 4x - 6 = 22 \\ +6 \quad +6 \\ \hline 4x = 28 \\ \frac{4x}{4} = \frac{28}{4} \\ x = 7 \end{array}$$

Side length:
 $8(7) - 6 = \boxed{50 \text{ ft}}$ **5**

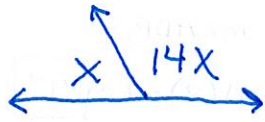
The figure below is a regular polygon. Find the value of x .



$$\begin{array}{r} 4x^2 + 8 = 4x^2 + 2x - 2 \\ -4x^2 \quad -4x^2 \\ \hline 8 = 2x - 2 \\ +2 \quad +2 \\ \hline 10 = 2x \\ \frac{10}{2} = \frac{2x}{2} \\ x = 5 \end{array}$$

$x = 5$ **6**

Two angles form a linear pair. The measure of one angle is 14 times the measure of the other angle. Find the measure of each angle.



$$x + 14x = 180$$

$$\frac{15x}{15} = \frac{180}{15}$$

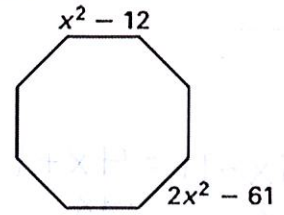
$$x = 12^\circ$$

$$14(12) = 168^\circ$$

check if they add to 180° ✓

7

The figure below is a regular polygon. Find the value of x and the length of one side.



$$\begin{array}{r} 2x^2 - 61 = x^2 - 12 \\ -x^2 \quad -x^2 \\ \hline x^2 - 61 = -12 \\ +61 \quad +61 \\ \hline \sqrt{x^2} = \sqrt{49} \\ x = 7 \end{array}$$

$$\begin{array}{l} (7)^2 - 12 = \\ 49 - 12 = 37 \\ \text{length} \end{array}$$

8

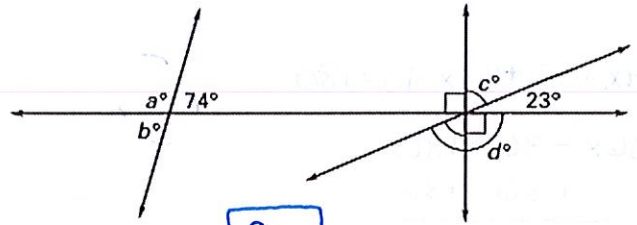
The expressions $(3x + 63)^\circ$ and $(7x - 45)^\circ$ represent the measures of two angles of a regular decagon. Find the measure of an angle of the decagon.

$$\begin{array}{r} 3x + 63 = 7x - 45 \\ -3x \quad -3x \\ \hline 63 = 4x - 45 \\ +45 \quad +45 \\ \hline 108 = 4x \\ \frac{108}{4} = \frac{4x}{4} \\ x = 27 \end{array}$$

$$\begin{array}{l} 3(27) + 63 \\ = 81 + 63 \\ = 144^\circ \end{array}$$

9

Find the measure of a , b , c and d .



$$a = 180 - 74 = 106^\circ$$

$$b = 74^\circ \text{ (vertical)}$$

$$c = 90 - 23 = 67^\circ$$

$$d = 90^\circ \text{ (right angle)}$$

10

$\angle A$ and $\angle B$ are supplementary angles. Find $m\angle A$ and $m\angle B$. add to 180°

$$m\angle A = (9x + 28.5)$$

$$m\angle B = -5x + 101.5$$

$$(9x + 28.5) + (-5x + 101.5) = 180$$

$$\begin{array}{r} 4x + 130 = 180 \\ -130 \quad -130 \\ \hline 4x = 50 \\ \frac{4x}{4} = \frac{50}{4} \\ x = 12.5 \end{array}$$

$$\begin{array}{l} m\angle A: \\ 9(12.5) + 28.5 \\ = 141^\circ \end{array}$$

$$\begin{array}{l} m\angle B: \\ -5(12.5) + 101.5 \\ = 39^\circ \end{array}$$

11

$\angle A$ and $\angle B$ are complementary angles. Find $m\angle A$ and $m\angle B$. add to 90°

$$m\angle A = (5x)^\circ$$

$$m\angle B = (17x + 2)^\circ$$

$$(5x) + (17x + 2) = 90$$

$$\begin{array}{r} 22x + 2 = 90 \\ -2 \quad -2 \\ \hline 22x = 88 \\ \frac{22x}{22} = \frac{88}{22} \\ x = 4 \end{array}$$

$$\begin{array}{l} m\angle A: \\ 5(4) = 20^\circ \end{array}$$

$$\begin{array}{l} m\angle B: \\ 17(4) + 2 = 70^\circ \end{array}$$

12