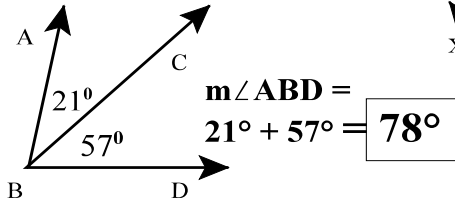


Angle Equations  
Geometry

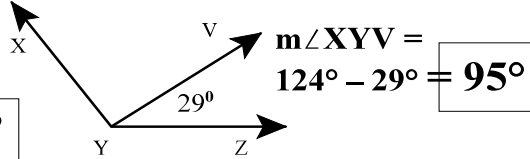
KEY

Given the information in each problem, find the measure of the indicated angle.

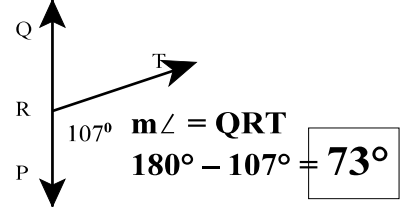
1) Find  $m\angle ABD$ ?



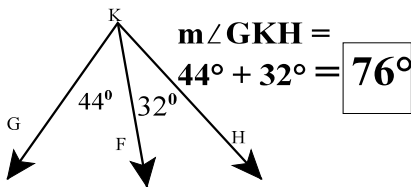
2)  $m\angle XYZ = 124^\circ$ . Find  $m\angle XYV$ .



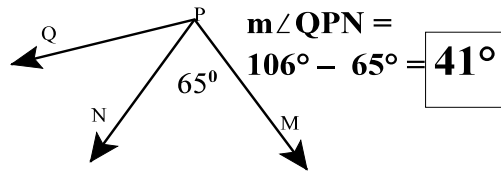
3) Find  $m\angle QRT$ .



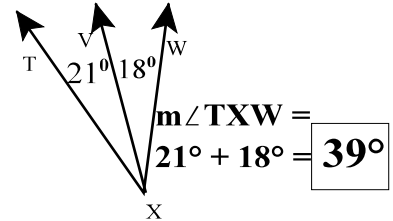
4) Find  $m\angle GKH$ .



5)  $m\angle QPM = 106^\circ$ . Find  $m\angle QPN$ .

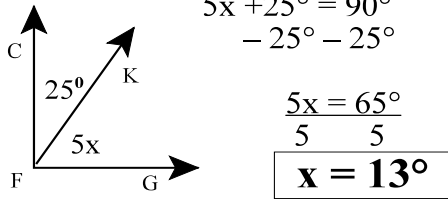


6) Find  $m\angle TXW$ .



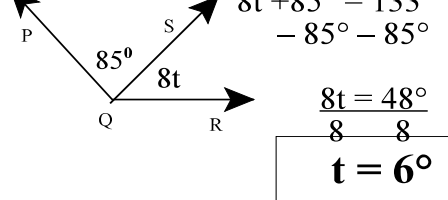
7)  $\angle CFG$  is a right angle.

Find  $x$ .

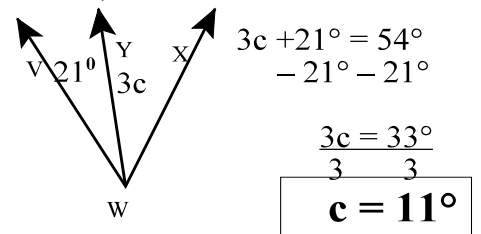


8)  $\angle PQR$  measures  $133^\circ$ .

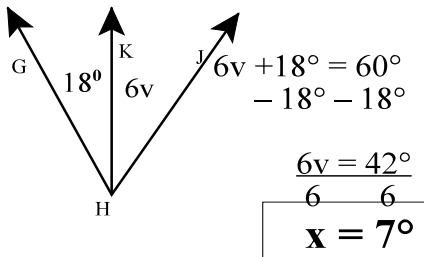
Find  $t$ .



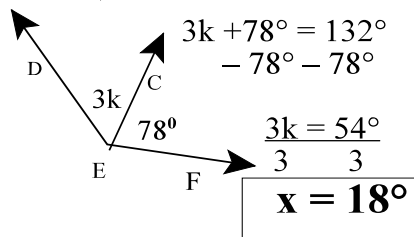
9)  $m\angle VWX = 54^\circ$ . Find  $c$ .



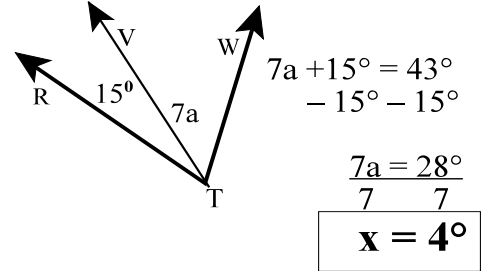
10)  $m\angle GHJ = 60^\circ$ . Find  $v$ .



11)  $m\angle DEF = 132^\circ$ . Find  $k$ .



12)  $m\angle RTW = 43^\circ$ . Find  $a$ .

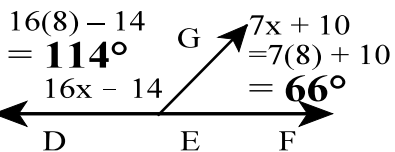


Find the measures of all angles.

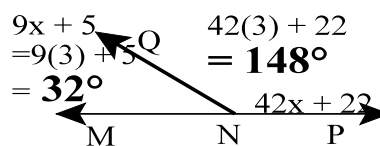
13)  $16x - 14 + 7x + 10 = 180^\circ$

14)

$9x + 5 + 42x + 22 = 180^\circ$

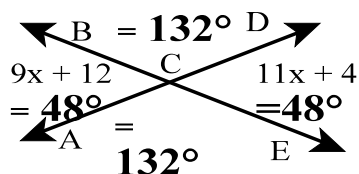


$$\begin{aligned} 23x - 4 &= 180^\circ \\ +4 &+4 \\ \hline 23x &= 184^\circ \\ \frac{23x}{23} &= \frac{184^\circ}{23} \\ x &= 8^\circ \end{aligned}$$

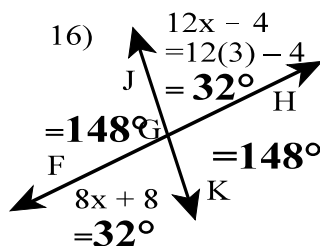


$$\begin{aligned} 51x + 27 &= 180^\circ \\ -27 &-27 \\ \hline 51x &= 153^\circ \\ \frac{51x}{51} &= \frac{153^\circ}{51} \\ x &= 3^\circ \end{aligned}$$

15)



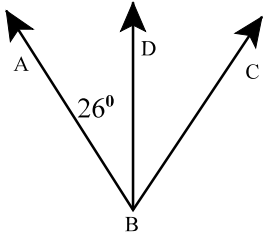
$$\begin{aligned} 9x + 12 &= 11x + 4 \\ -9x &-9x \\ \hline 12 &= 2x + 4 \\ -4 &-4 \\ \hline 8 &= 2x \\ \frac{8}{2} &= \frac{2x}{2} \\ x &= 4 \end{aligned}$$



$$\begin{aligned} 12x - 4 &= 8x + 8 \\ -8x &-8x \\ \hline 4x - 4 &= 8 \\ +4 &+4 \\ \hline 4x &= 12 \\ \frac{4x}{4} &= \frac{12}{4} \\ x &= 3 \end{aligned}$$

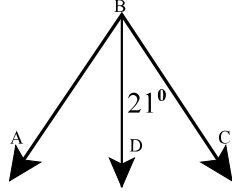
In each figure below,  $\overrightarrow{BD}$  is the angle bisector of  $\angle ABC$ .

17) Find  $m\angle ABC$ .



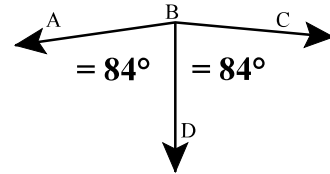
$$m\angle ABC = 26^\circ + 26^\circ = \boxed{52^\circ}$$

18) Find  $m\angle ABC$ .



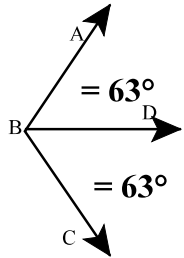
$$m\angle ABC = 21^\circ + 21^\circ = \boxed{42^\circ}$$

19)  $m\angle ABC = 168^\circ$ . Find  $m\angle ABD$  and  $m\angle CBD$ .



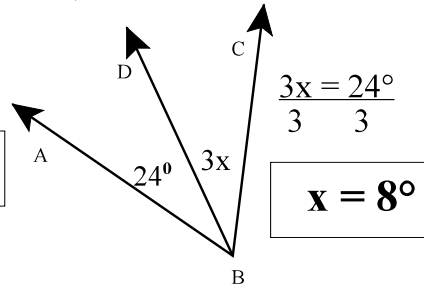
$$168^\circ \div 2 = \boxed{84^\circ}$$

20)  $m\angle ABC = 126^\circ$ . Find  $m\angle ABD$  and  $m\angle CBD$ .



$$126^\circ \div 2 = \boxed{63^\circ}$$

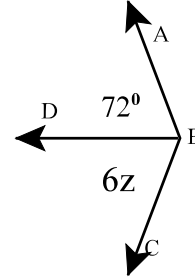
21) Find  $x$ .



$$\frac{3x}{3} = \frac{24}{3}$$

$$\boxed{x = 8^\circ}$$

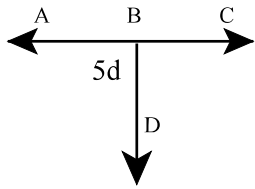
22) Find  $z$ .



$$\frac{6z}{6} = \frac{72}{6}$$

$$\boxed{z = 12^\circ}$$

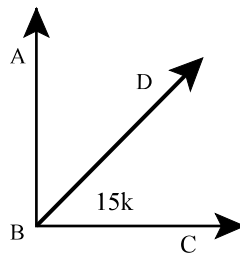
23)  $\angle ABC$  is a straight angle. Find  $d$ .



$$\frac{5d}{5} = \frac{90}{5}$$

$$\boxed{d = 18^\circ}$$

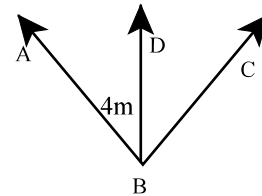
24)  $\angle ABC$  is a right angle. Find  $k$ .



$$\frac{15k}{15} = \frac{45}{15}$$

$$\boxed{k = 3^\circ}$$

25)  $m\angle ABC = 88^\circ$ . Find  $m$ .



$$\frac{4m}{4} = \frac{44}{4}$$

$$\boxed{m = 11^\circ}$$

26)  $\angle 1$  and  $\angle 2$  are complementary angles.  $\angle 1$  is four times the measure of  $\angle 2$ . What do both angles measure?

$$m\angle 1 = 4x = 4(18^\circ) = \boxed{72^\circ}$$

$$m\angle 2 = x = \boxed{18^\circ}$$

$$4x + x = 90^\circ$$

$$\frac{5x}{5} = \frac{90}{5}$$

$$x = 18^\circ$$

27)  $\angle C$  and  $\angle D$  are supplementary angles.  $\angle C$  is  $32^\circ$  greater than  $\angle D$ . What do both angles measure?

$$m\angle C = x + 32^\circ = 74^\circ + 32^\circ = \boxed{106^\circ}$$

$$m\angle D = x = \boxed{74^\circ}$$

$$x + 32^\circ + x = 180^\circ$$

$$2x + 32^\circ = 180^\circ$$

$$\underline{-32^\circ \quad -32^\circ}$$

$$\frac{2x}{2} = \frac{148}{2}$$

$$x = 74^\circ$$