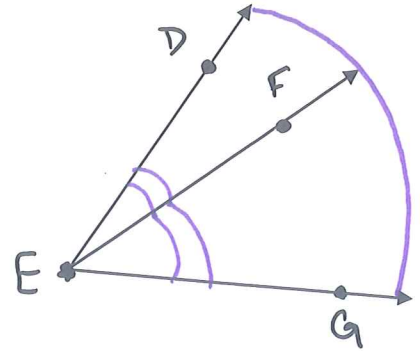


Key Schmidt

Practice Worksheet 1.5A – Angle Bisectors

Geometry Homework

For # 1-5, \overline{EF} bisects $\angle DEG$. (The diagram is not drawn to scale.)



- If $m\angle DEG = 88^\circ$, find $m\angle FEG = \underline{44^\circ}$
- If $m\angle FED = 27^\circ$, find $m\angle GED = \underline{54^\circ}$

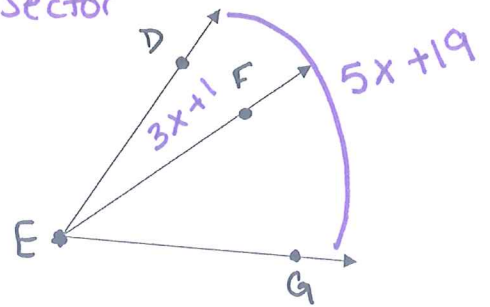
3. If $m\angle DEF = 3x+1$ and $m\angle DEG = 5x+19$, find the value of x .

$\angle DEG = 2 \angle DEF$ def of \angle bisector

$$5x+19 = 2(3x+1)$$

$$5x+19 = 6x+2$$

$$\begin{array}{r} -5x \quad -5x \\ 19 = x + 2 \\ -2 \quad -2 \\ \hline 17 = x \end{array}$$

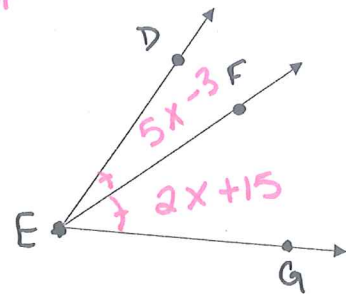


4. If $m\angle DEF = 5x-3$ and $m\angle FEG = 2x+15$, find the value of x .

$\angle DEF \cong \angle FEG$ def of \angle bisector

$$5x-3 = 2x+15$$

$$\begin{array}{r} -2x \quad -2x \\ 3x-3 = 15 \\ +3 \quad +3 \\ \hline 3x = 18 \\ \frac{3x}{3} = \frac{18}{3} \\ x = 6 \end{array}$$



5. If $m\angle FEG = 6x-7$ and $m\angle FED = 2x+41$, find the $m\angle DEG$. (solve for x first!)

$\angle FEG \cong \angle FED$ def of \angle bisector

$$6x-7 = 2x+41$$

$$\begin{array}{r} -2x \quad -2x \\ 4x-7 = 41 \\ +7 \quad +7 \\ \hline 4x = 48 \\ \frac{4x}{4} = \frac{48}{4} \\ x = 12 \end{array}$$

Find $m\angle DEG$.

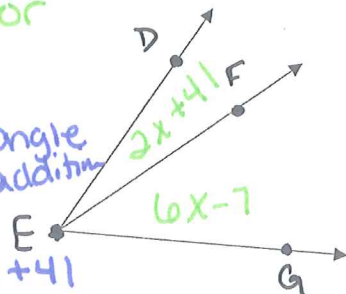
angle addition

$$\angle DEG = \angle FEG + \angle FED$$

$$\angle DEG = 6x-7 + 2x+41$$

$$\angle DEG = 6(12)-7 + 2(12)+41$$

$$\angle DEG = 130^\circ$$



For #6-9, \overline{BX} is the BISECTOR of $\angle ABC$. (Diagrams are not drawn to scale)

6. If $m\angle ABX = 5x$ and $m\angle XBC = 3x + 10$, find the $m\angle ABC$. (Solve for x first!)

$\angle ABX \cong \angle XBC$ def of \angle bisector.

$$\begin{array}{r} 5x = 3x + 10 \\ -3x \quad -3x \\ \hline 2x = 10 \end{array}$$

$$2x = 10$$

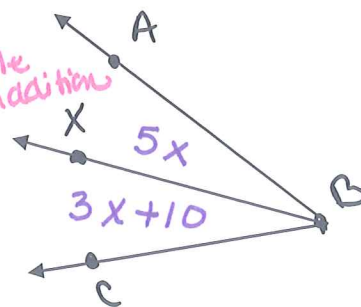
$$\boxed{x = 5}$$

$\angle ABC = \angle ABX + \angle XBC$ Angle addition

$$\angle ABC = 5x + 3x + 10$$

$$\angle ABC = 5(5) + 3(5) + 10$$

$$\boxed{\angle ABC = 50^\circ}$$



7. If $m\angle ABC = 4x - 12$ and $m\angle ABX = 24$, find the value of x .

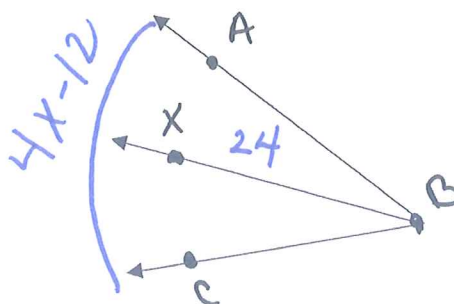
$\angle ABC = 2 \angle ABX$ def of \angle bisector

$$4x - 12 = 2(24)$$

$$4x - 12 = 48$$

$$4x = 60$$

$$\boxed{x = 15}$$



8. If $m\angle ABC = 4x + 16$ and $m\angle CBX = 3x + 6$, find the value of x .

$\angle ABC = 2 \angle CBX$ def of \angle bisector

$$4x + 16 = 2(3x + 6)$$

$$4x + 16 = 6x + 12$$

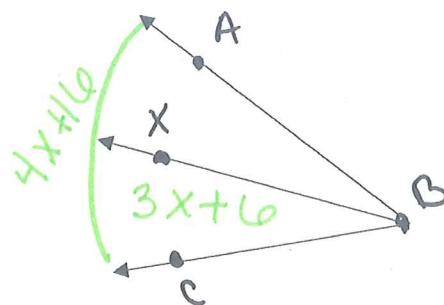
$$\begin{array}{r} -4x \quad -4x \\ \hline 16 = 2x + 12 \end{array}$$

$$16 = 2x + 12$$

$$\begin{array}{r} -12 \quad -12 \\ \hline 4 = 2x \end{array}$$

$$4 = 2x$$

$$\boxed{x = 2}$$



9. If $m\angle ABC = 5x + 18$ and $m\angle CBX = 2x + 12$, find the value of x , and the $m\angle ABC$.

$\angle ABC = 2 \angle CBX$ def of \angle bisector

$$5x + 18 = 2(2x + 12)$$

$$5x + 18 = 4x + 24$$

$$\begin{array}{r} -4x \quad -4x \\ \hline x + 18 = 24 \end{array}$$

$$x + 18 = 24$$

$$\begin{array}{r} -18 \quad -18 \\ \hline x = 6 \end{array}$$

$$\boxed{x = 6}$$

$$\angle ABC = 5x + 18$$

$$\angle ABC = 5(6) + 18$$

$$\boxed{\angle ABC = 48^\circ}$$

