

# Module 3 · Topic B Study Guide

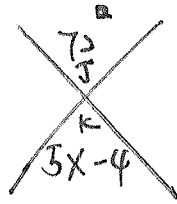
Name \_\_\_\_\_

Date \_\_\_\_\_

1. Two vertical angles are labeled as  $\angle J$  and  $\angle K$ . The measure of  $\angle J$  is  $72^\circ$ . The measure of  $\angle K$  is  $(5x - 4)^\circ$ .

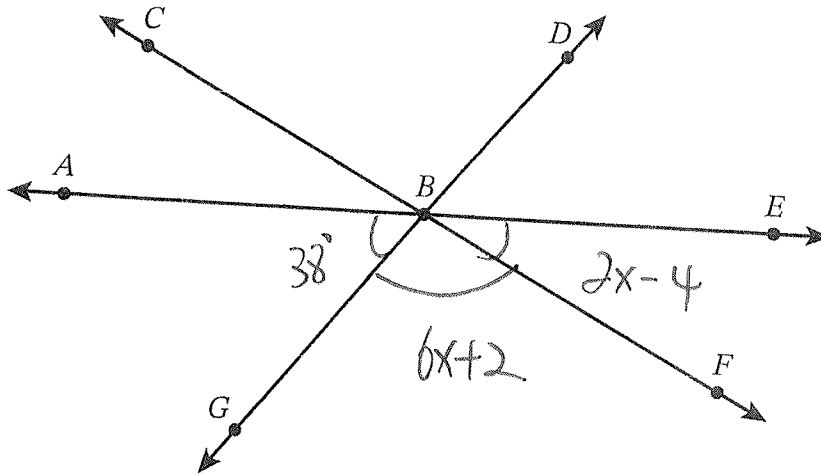
Solve for  $x$ .

- A. 4.4
- B. 13.6
- C. 15.2
- D. 22.4



$$\begin{aligned} 5x - 4 &= 72 \\ +4 & \quad +4 \\ \hline 5x &= 76 \\ \frac{5x}{5} &= \frac{76}{5} \\ x &= 15.2 \end{aligned}$$

2. The diagram shows  $\overleftrightarrow{AE}$  intersecting  $\overleftrightarrow{CF}$  and  $\overleftrightarrow{DG}$  at point  $B$ .



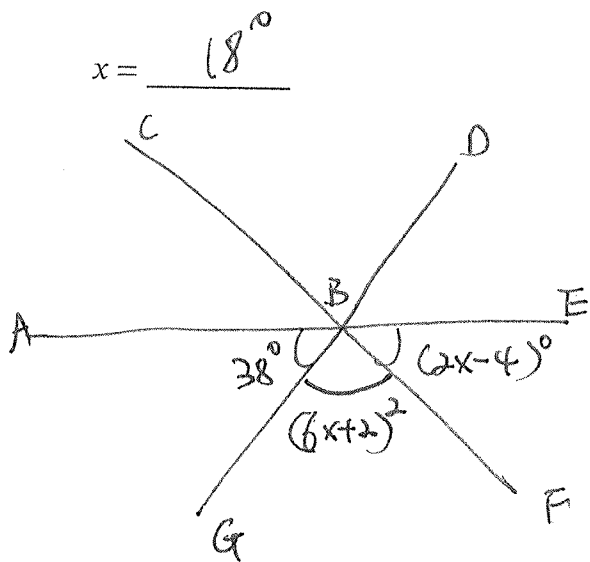
**Part A**

Indicate whether each statement is true or false.

	True	False
The sum of the measures of $\angle DBE$ and $\angle EBF$ is always equal to $90^\circ$ .		X
The measure of $\angle EBF$ is always equal to the measure of $\angle CBA$ .	X	
The sum of the measures of $\angle FBE$ , $\angle EBD$ , and $\angle DBC$ is always equal to $180^\circ$ .	X	
The measure of $\angle GBF$ is always equal to the measure of $\angle EBD$ .		X
The sum of the measures of $\angle FBG$ , $\angle EBD$ , and $\angle DBC$ is always equal to $180^\circ$ .		X
The sum of the measures of $\angle ABG$ , $\angle DBC$ , and $\angle FBE$ is always equal to $180^\circ$ .	X	

**Part B**

Solve for  $x$  given that  $m\angle ABG = 38^\circ$ ,  $m\angle FBE = (2x - 4)^\circ$ , and  $m\angle GBF = (6x + 2)^\circ$ .



$x = \underline{18^\circ}$

$38$	$6x+2$	$2x-4$
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$\swarrow \quad \searrow$   
 $180^\circ$

$$38 + 6x + 2 + 2x - 4 = 180$$

$$\underline{6x + 2x + 38 + 2 - 4} = 180$$

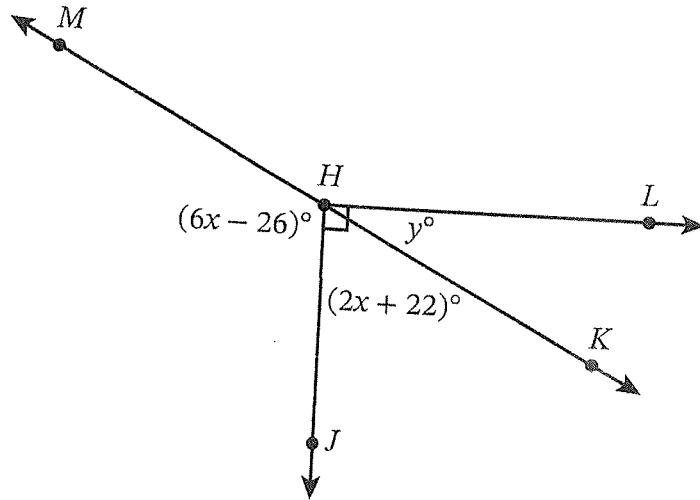
$$8x + 36 = 180$$

$$\underline{-36} \qquad \underline{-36}$$

$$\leftarrow \quad \underline{8x} \qquad = \underline{\underline{144}} \quad \leftarrow$$

$x = 18^\circ$

3. The diagram shows  $\overleftrightarrow{MK}$  intersecting  $\overleftrightarrow{HJ}$  and  $\overleftrightarrow{HL}$  at point  $H$ .

**Part A**

Write an equation that can be used to solve for  $x$ .

$$(6x - 26) + (2x + 22) = 180$$

**Part B**

What is the measure of  $\angle LHK$ ?

22.

$$2x + 22 + y = 90^\circ$$

$$2(23) + 22 + y = 90$$

$$46 + 22 + y = 90$$

$$\begin{array}{r} 68 + y = 90 \\ -68 \quad -68 \end{array}$$

$$y = 22$$

$$\underline{6x - 26} + \underline{2x + 22} = 180$$

$$6x + 2x - 26 + 22 = 180$$

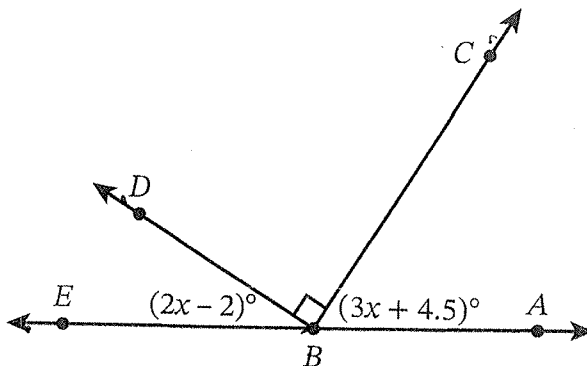
$$8x - 4 = 180$$

$$\begin{array}{r} +4 \quad +4 \end{array}$$

$$\begin{array}{r} \hline \frac{8x}{8} = \frac{184}{8} \end{array}$$

$$x = 23$$

4. The diagram shows  $\overleftrightarrow{EA}$  intersecting  $\overrightarrow{BC}$  and  $\overrightarrow{BD}$  at point  $B$ .



If  $\angle ABC$  and  $\angle DBE$  are complementary angles, what is the measure of  $\angle DBE$ ?

A.  $57^\circ$

B.  $35.5^\circ$

C.  $33^\circ$

D.  $17.5^\circ$

$$2x - 2 + 3x + 4.5 = 90$$

$$2x + 3x - 2 + 4.5 = 90$$

$$5x + 2.5 = 90$$

$$\underline{\quad -2.5 \quad -2.5 \quad}$$

$$\frac{5x}{5} = \frac{87.5}{5}$$

$$x = 17.5$$

$$m\angle DBE = (2(17.5) - 2)$$

$$= 35 - 2$$

$$= 33^\circ$$