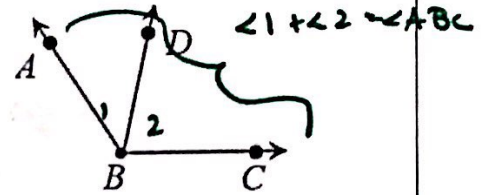


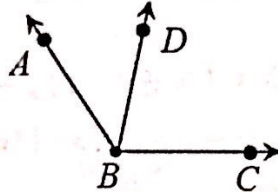
# ANGLE ADDITION Postulate

If D is in the interior of  $\angle ABC$ , then  
 $m\angle ABD + m\angle DBC = m\angle ABC$



## Examples

Use the diagram below to answer questions 1 and 2



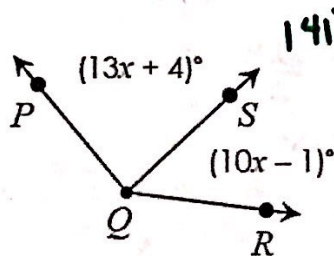
1. If  $m\angle ABD = 48^\circ$  and  $m\angle DBC = 78^\circ$ , find  $m\angle ABC$ .

$$48 + 78 = 126^\circ$$

2. If  $m\angle DBC = 74^\circ$  and  $m\angle ABC = 119^\circ$ , find  $m\angle ABD$ .

$$119 - 74 = 45^\circ$$

3. If  $m\angle PQR = 141^\circ$ , find each measure.



$$13x + 4 + 10x - 1 = 141$$

$$23x + 3 = 141$$

$$\underline{-3 \quad -3}$$

$$23x = 138$$

$$\underline{23}$$

$$x = 6$$

$$13(6) + 4 = 102$$

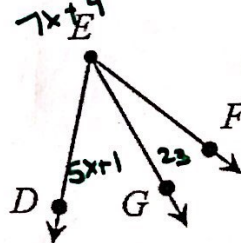
$$10(6) - 1 = 39$$

$$x = 6$$

$$m\angle PQS = 102^\circ$$

$$m\angle SQR = 39^\circ$$

4. If  $m\angle DEF = (7x + 4)^\circ$ ,  $m\angle DEG = (5x + 1)^\circ$ , and  $m\angle GEF = 23^\circ$ , find each measure.



$$5x + 1 + 23 = 7x + 4$$

$$5x + 24 = 7x + 4$$

$$\underline{-5x \quad -5x}$$

$$24 = 2x + 4$$

$$\underline{-4 \quad -4}$$

$$20 = 2x$$

$$\underline{2 \quad 2}$$

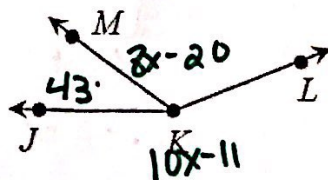
$$10 = x$$

$$x = 10$$

$$5(10) + 1 = m\angle DEG = 51$$

$$m\angle DEF = 74$$

5. If  $m\angle JKM = 43^\circ$ ,  $m\angle MKL = (8x - 20)^\circ$ , and  $m\angle JKL = (10x - 11)^\circ$ , find each measure.



$$43 + 8x - 20 = 10x - 11$$

$$8x + 23 = 10x - 11$$

$$\underline{-8x \quad -8x}$$

$$23 = 2x - 11$$

$$\underline{+11 \quad +11}$$

$$34 = 2x$$

$$\underline{2 \quad 2}$$

$$17 = x$$

$$8(17) - 20$$

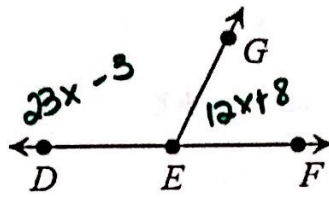
$$x = 17$$

$$m\angle MKL = 116^\circ$$

$$m\angle JKL = 159^\circ$$

180°

6. If  $\angle DEF$  is a straight angle,  $m\angle DEG = (23x - 3)^\circ$ , and  $m\angle GEF = (12x + 8)^\circ$ , find each measure.



$$23x - 3 + 12x + 8 = 180$$

$$35x + 5 = 180$$

$$\underline{-5 \quad -5}$$

$$35x = 175$$

$$x = 5$$

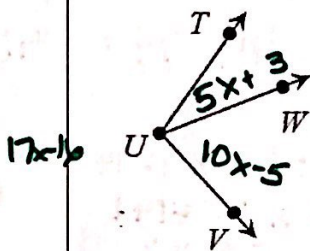
$$x = \underline{5}$$

$$m\angle DEG = \underline{112^\circ}$$

$$m\angle GEF = \underline{68^\circ}$$

$$m\angle DEF = \underline{180^\circ}$$

7. If  $m\angle TUW = (5x + 3)^\circ$ ,  $m\angle WUV = (10x - 5)^\circ$ , and  $m\angle TUV = (17x - 16)^\circ$ , find each measure.



$$5x + 3 + 10x - 5 = 17x - 16$$

$$15x - 2 = 17x - 16$$

$$\underline{-15x \quad -15x}$$

$$-2 = 2x - 16$$

$$\underline{+16 \quad +16}$$

$$\underline{14 = 2x}$$

$$7 = x$$

$$5(7) + 3 = 38$$

$$10(7) - 5 = 65$$

$$x = \underline{7}$$

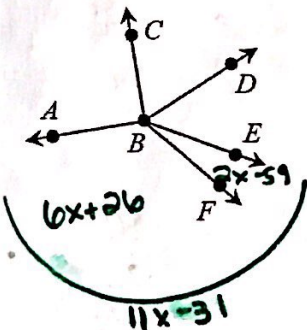
$$m\angle TUW = \underline{38^\circ}$$

$$m\angle WUV = \underline{65^\circ}$$

$$m\angle TUV = \underline{103^\circ}$$

Use the diagram to the left to answer questions 8 and 9.

8. If  $m\angle ABF = (6x + 26)^\circ$ ,  $m\angle EBF = (2x - 59)^\circ$ , and  $m\angle ABE = (11x - 31)^\circ$ , find  $m\angle ABF$ .



$$6x + 26 + 2x - 59 = 11x - 31$$

$$8x - 33 = 11x - 31$$

$$\underline{-8x \quad -8x}$$

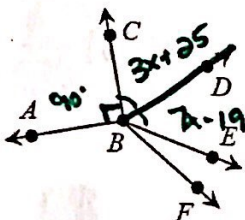
$$-33 = 3x - 31$$

$$\underline{+31 \quad +31}$$

$$-2 = 3x$$

TYPO

9. If  $\overline{BD}$  bisects  $\angle CBE$ ,  $\overline{BC} \perp \overline{BA}$ ,  $m\angle CBD = (3x + 25)^\circ$ , and  $m\angle CBD = (7x - 19)^\circ$ , find  $m\angle ABD$ .



$$3x + 25 = 7x - 19$$

$$\underline{-3x \quad -3x}$$

$$25 = 4x - 19$$

$$\underline{+19 \quad +19}$$

$$\underline{44 = 4x}$$

$$\underline{4}$$

$$x = 11$$

$$3(11) + 25$$

$$33 + 25$$

$$58$$

$$90 - 58 = 148^\circ$$

$$m\angle ABD = 148^\circ$$