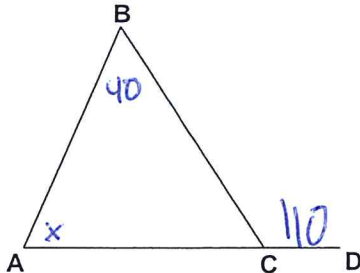


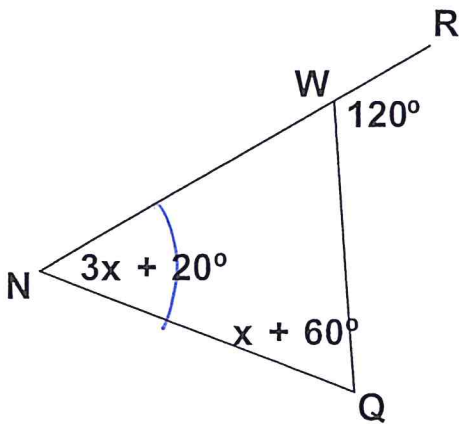
Exterior Angle Theorem

1. If $m\angle BCD = 110^\circ$ and $m\angle ABC = 40^\circ$, find $m\angle BAC$



$$\begin{array}{r} x + 40 = 110 \\ -40 \quad -40 \\ \hline x = 70 \end{array}$$

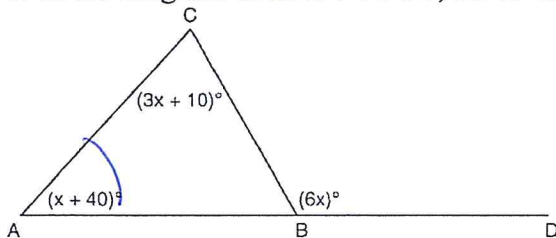
2. Find the measure of $\angle QNW$ below



$$\begin{array}{r} 3x + 20 + x + 60 = 120 \\ 4x + 80 = 120 \\ -80 \quad -80 \\ \hline 4x = 40 \\ \frac{4x}{4} = \frac{40}{4} \\ x = 10 \end{array}$$

$$3(10) + 20 = 50^\circ$$

3. In the diagram of $\triangle ABC$ below, \overline{AB} is extended to point D .



$$\begin{array}{r} 3x + 10 + x + 40 = 6x \\ 4x + 50 = 6x \\ -4x \quad -4x \\ \hline 50 = 2x \\ \frac{50}{2} = \frac{2x}{2} \\ 25 = x \end{array}$$

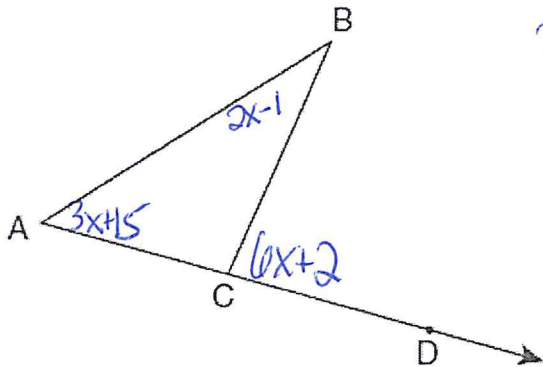
If $m\angle CAB = x + 40$, $m\angle ACB = 3x + 10$, $m\angle CBD = 6x$, what is $m\angle CAB$?

- 1) 13
- 2) 25
- 3) 53
- 4) 65

$$25 + 40 = 65$$

4. In the diagram below, $\triangle ABC$ is shown with \overline{AC} extended through point D .

If $m\angle BCD = 6x + 2$, $m\angle BAC = 3x + 15$, and $m\angle ABC = 2x - 1$, what is the value of x ?



$$3x + 15 + 2x - 1 = 6x + 2$$

$$5x + 14 = 6x + 2$$

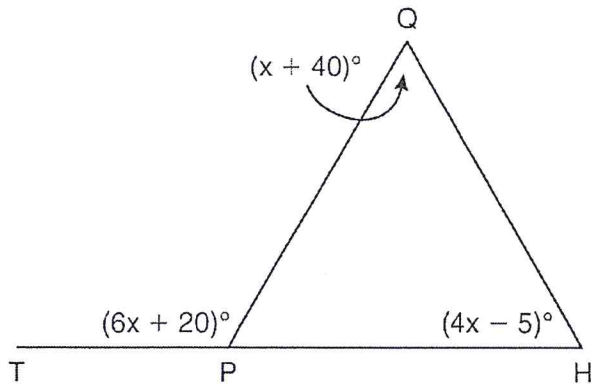
$$-x \quad -6x$$

$$14 = x + 2$$

$$-2 \quad -2$$

$$12 = x$$

5. In the diagram below of $\triangle HQP$, side \overline{HP} is extended through P to T , $m\angle QPT = 6x + 20$, $m\angle HQP = x + 40$, and $m\angle PHQ = 4x - 5$. Find $m\angle QPT$.



(Not drawn to scale)

$$x + 40 + 4x - 5 = 6x + 20$$

$$5x + 35 = 6x + 20$$

$$-5x \quad -5x$$

$$35 = x + 20$$

$$-20 \quad -20$$

$$15 = x$$

$$6(15) + 20 = 110^\circ$$

6. In the diagram below of triangle ABC , \overline{AC} is extended through point C to point D , and \overline{BE} is drawn to \overline{AC} .

Which equation is always true?

- 1) $m\angle 1 = m\angle 3 + m\angle 2$
- 2) $m\angle 5 = m\angle 3 - m\angle 2$
- 3) $m\angle 6 = m\angle 3 - m\angle 2$
- 4) $m\angle 7 = m\angle 3 + m\angle 2$

