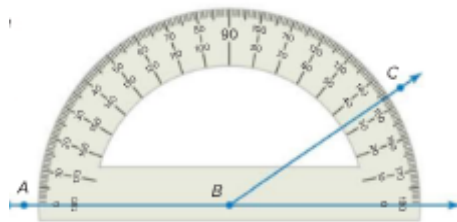


Section 2.6: Proving Angle Relationships.

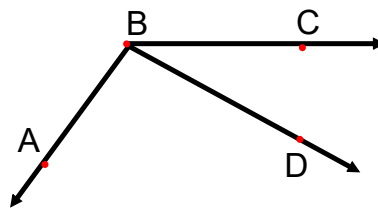
Supplementary and Complementary Angles. The Protractor Postulate illustrates the relationship between angle measures and real numbers.

Postulate 2.10 Protractor Postulate: Given any angle, the measure can be put into one to one correspondence with real numbers between 0 and 180.

If ray BA is placed along the protractor at 0 degrees, then the measure of $\angle ABC$ corresponds to a positive real number.



Postulate 2.11 Angle Addition Postulate: D is in the interior of $\angle ABC$ if and only if $m\angle ABD + m\angle DBC = m\angle ABC$



Example:

Find $m\angle 1$ if $m\angle 2 = 56$ and $m\angle JKL = 145$. Justify your steps.

$$m\angle 1 + m\angle 2 = m\angle JKL$$

$$x + 56 = 145$$

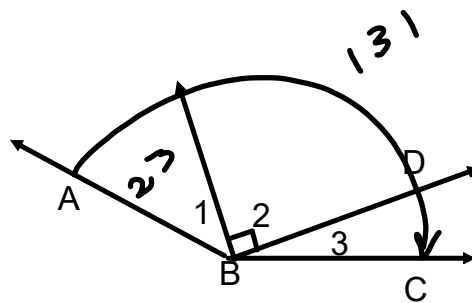
$$\quad - 56 \quad - 56$$

$$x = 89$$

Example:

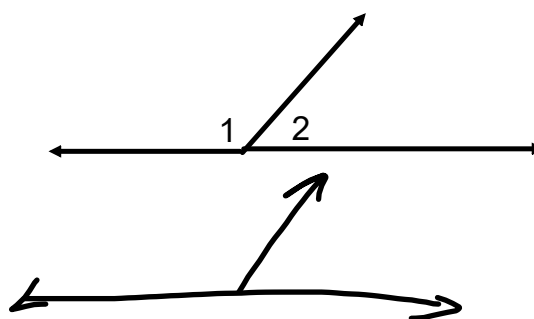
Find $m\angle 3$ if $m\angle 1 = 23$ and $m\angle ABC = 131$. Justify each step.

$$m\angle 3 = 131 - 23 - 90 = 18^\circ$$



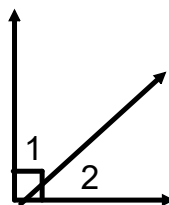
Theorem 2.3 Supplement Theorem. If two angles form a linear pair, then they are supplementary angles.

$$m\angle 1 + m\angle 2 = 180$$



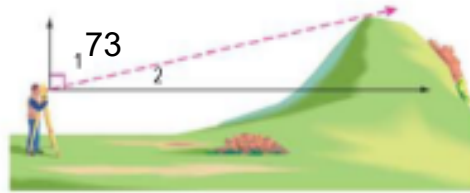
Theorem 2.4 Complement Theorem. If the non-common sides of two adjacent angles form a right angle, then the angles are complementary angles.

$$m\angle 1 + m\angle 2 = 90$$



Example: Surveying. Using a transit, a surveyor sights the top of a hill and records an angle measure of about 73 degrees. What is the measure of the angle from the top of the hill makes with the horizon? Justify

Complement Thm.



$$90 - 73 = 17$$

Example: $\angle 6$ and $\angle 7$ form a linear pair. If $m\angle 6 = 3x + 32$ and $m\angle 7 = 5x + 12$, find x and the measure of both angles. Justify

