# 1.5 – Angle Relationships

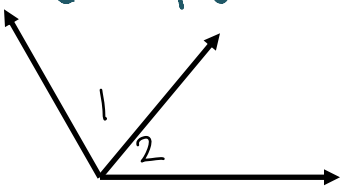
**Goals Aligned to Common Core State Standards:**

- You will identify and use special pairs of angles and perpendicular lines.
- You will construct perpendiculars.

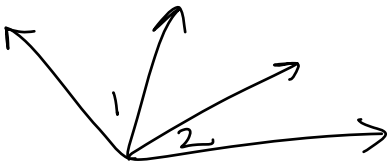
Pairs of Angles

- **Adjacent** angles: next to

example

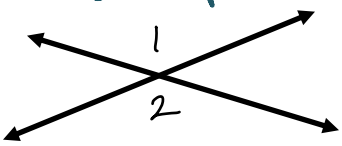



non example

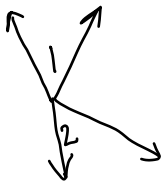



- **Vertical** Angles: angles opposite of each other created by 2 intersecting lines.

example

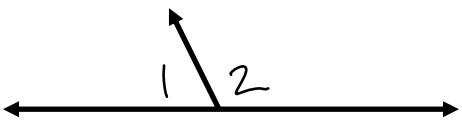



nonexample

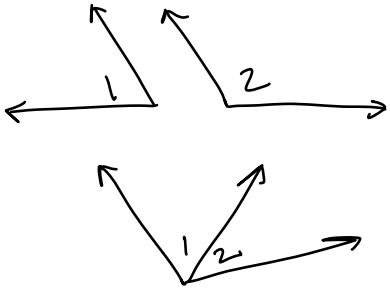



- **Linear Pair**: 2 angles that create a line

example




nonexample



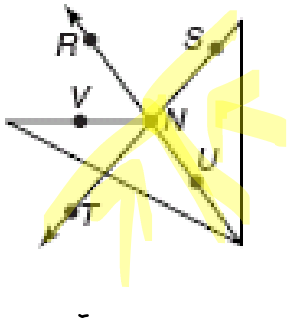
Angle Relationships

- **Complementary** Angles: 2 ∠'s that add to 90°

- **Supplementary** Angles: 2 ∠'s that add to 180°

Ex. Identify:

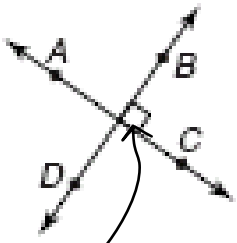
1) 2 obtuse vertical angles:
   ∠SNU, ∠RNT
2) 2 acute adjacent angles:
   ∠RNV, ∠VNT
3) An angle supplementary to ∠TNU:
   ∠SNU




## *** Vertical Angles Task ***

Perpendicular Lines

- Lines that intersect at right angles.
- Can be lines, line segments, or rays
- Symbol in writing: ⊥ $\overleftrightarrow{AC} \perp \overleftrightarrow{BD}$
- Symbol in picture:



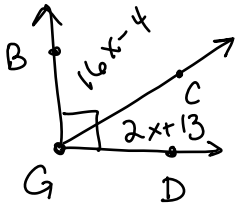

4.) If ∠BGD is a right angle and point C is in the interior of that angle, find x when m∠BGC=16x-4 and m∠CGD=2x+13.

$16x - 4 + 2x + 13 = 90$

$18x + 9 = 90$

$18x = 81$

$x = 4.5$



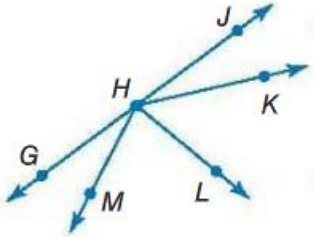
Pg. 55 Construct Perpendiculars through point on and off line.

Assumptions:

You cannot assume things are congruent or perpendicular just because they look like it!

**KeyConcept Interpreting Diagrams**

| CAN be Assumed | CANNOT be Assumed |
|---|---|
| All points shown are coplanar. | Perpendicular lines: $\overrightarrow{HM} \perp \overrightarrow{HL}$ |
| $G$, $H$, and $J$ are collinear. | Congruent angles: $\angle JHK \cong \angle GHM$ |
| $\overrightarrow{HM}$, $\overrightarrow{HL}$, $\overrightarrow{HK}$, and $\overleftrightarrow{GJ}$ intersect at $H$. | $\angle JHK \cong \angle KHL$ |
| $H$ is between $G$ and $J$. | $\angle KHL \cong \angle LHM$ |
| $L$ is in the interior of $\angle MHK$. | Congruent segments: $\overline{GH} \cong \overline{HJ}$ |
| $\angle GHM$ and $\angle MHL$ are adjacent angles. | $\overline{HJ} \cong \overline{HK}$ |
| $\angle GHL$ and $\angle LHJ$ are a linear pair. | $\overline{HK} \cong \overline{HL}$ |
| $\angle JHK$ and $\angle KHG$ are supplementary. | $\overline{HL} \cong \overline{HG}$ |

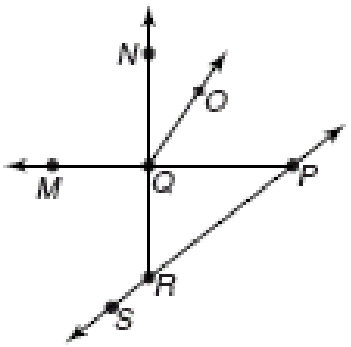



Examples: Determine whether each statement can be assumed from the figure. Explain.

8) $\angle NQO$ and $\angle OQP$ are complementary.

9) $\angle SRQ$ and $\angle QRP$ is a linear pair.

10) $\angle MQN$ and $\angle PQR$ are vertical angles.



## Goals Aligned to Common Core State Standards:

- You can identify and use special pairs of angles and perpendicular lines.
- You can construct perpendiculars.

Homework:
Angle Relationships Worksheet & Pg. 51 #19-23odd, 29-33odd, 34, 35-41odd