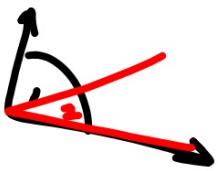
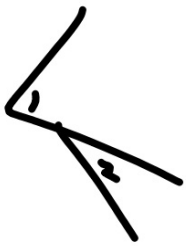
Geometry 1.5
Identify and use special pairs of angles
Identify perpendicular lines
Interpret diagrams

adjacent angles
linear pair
vertical angles
complementary angles
supplementary angles
perpendicular
assumptions



Plates
coffee stirrers

Quiz 1.3-1.4



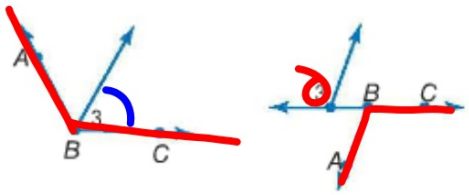
Next door neighbors

p. 46

Adjacent angles are two angles that lie in the same plane and have a common vertex and a common side, but no common interior points.

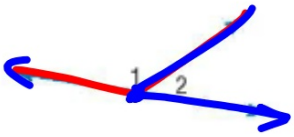
Examples $\angle 1$ and $\angle 2$ are adjacent angles.

Nonexamples $\angle 3$ and $\angle ABC$ are nonadjacent angles



A **linear pair** is a pair of adjacent angles with noncommon sides that are opposite rays.

Example $\angle 1$ and $\angle 2$



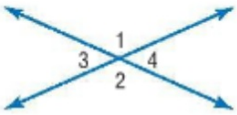
Nonexample $\angle ADB$ and $\angle ADC$

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

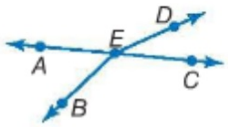
≅ congruent

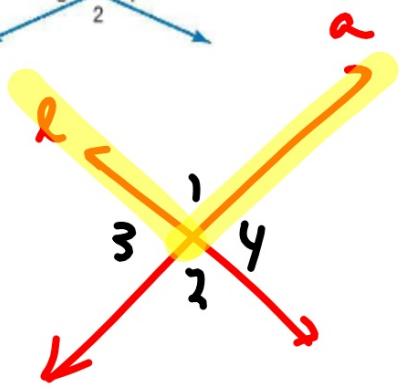
Vertical angles are two nonadjacent angles formed by two intersecting lines.

Examples $\angle 1$ and $\angle 2$; $\angle 3$ and $\angle 4$



Nonexample $\angle AEB$ and $\angle DEC$



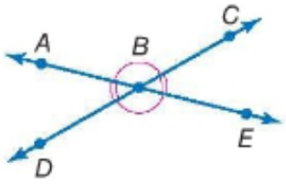


coffee
stirrers

KeyConcept Angle Pair Relationships

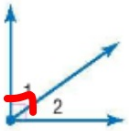
Vertical angles are congruent.

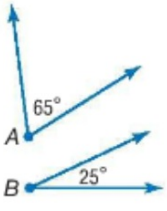
Examples $\angle ABC \cong \angle DBE$ and $\angle ABD \cong \angle CBE$



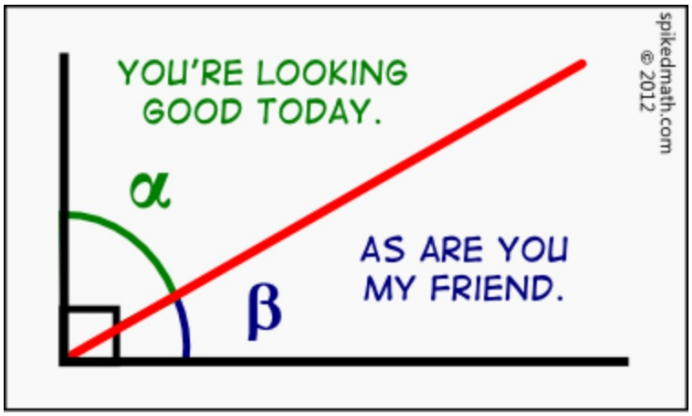
Complementary angles are two angles with measures that have a sum of 90.

Examples $\angle 1$ and $\angle 2$ are complementary.
$\angle A$ is complementary to $\angle B$.





Not required to be adjacent
(although they might be)



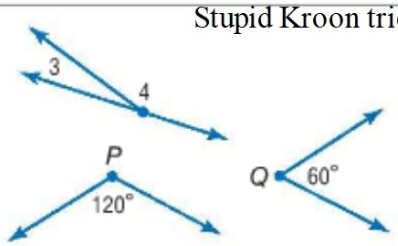
COMPLIMENTARY ANGLES

Not required to be adjacent (although they might be)

Stupid Kroon trick...

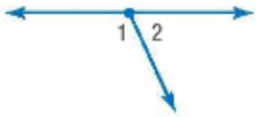
Supplementary angles are two angles with measures that have a sum of 180.

Examples $\angle 3$ and $\angle 4$ are supplementary.
$\angle P$ and $\angle Q$ are supplementary.



The angles in a linear pair are supplementary.

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



90 complementary

180 supplementary

x+y=

Example 2 Angle Measure

ALGEBRA Find the measures of two supplementary angles if the difference in the measures of the two angles is 18.

$99 + y = 180$

$x + y = 180$

$x - y = 18$

$2x = 198$

$\frac{2x}{2} = \frac{198}{2}$

$x = 99$

$x = 1^{st}$ $99°$

$y = 2^{nd}$ $81°$

x+y=

2. Find the measures of two complementary angles if the measure of the larger angle is 12 more than twice the measure of the smaller angle.

$x + y = 90$

$x + 26 = 90$

$x = 2y + 12$

$x = 1^{st}$ $64°$

$y = 2^{nd}$ $26°$

$2y + 12 + y = 90$

$3y + 12 = 90$

$-12 \quad -12$

$3y = 78$

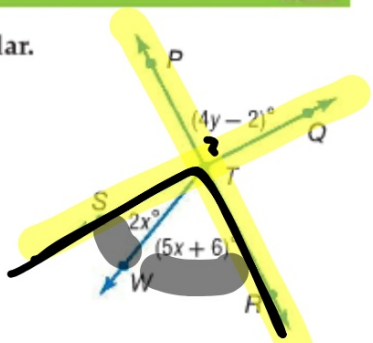
$y = 26$

Purr-pendicular...

meet at 90°

Example 3 Perpendicular Lines

ALGEBRA Find x and y so that $\overleftrightarrow{PR}$ and $\overleftrightarrow{SQ}$ are perpendicular.



$2x + 5x + 6 = 90$

$7x + 6 = 90$

$-6 \quad -6$

$7x = 84$

$x = 12$

$x = 12$

$y = 23$

$4y - 2 = 90$

$+2 \quad +2$

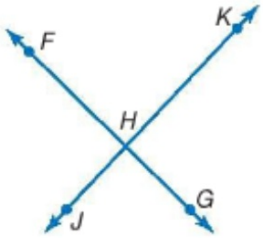
$4y = 92$

Interpreting diagrams:
When is it OK to eyeball it?

When you assume...

In the figure at the right, it *appears* that $\overleftrightarrow{FG} \perp \overleftrightarrow{JK}$. However, you cannot assume this is true unless other information, such as $m\angle FHJ = 90$, is given.

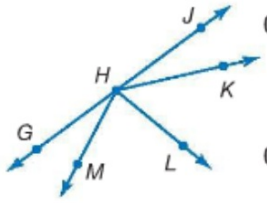
In geometry, figures are sketches used to depict a situation. They are not drawn to reflect total accuracy. There are certain relationships that you can assume to be true, but others you cannot. Study the figure and the lists below.



OK:
Relationships

KeyConcept Interpreting Diagrams

CAN be Assumed	CANNOT be Assumed
All points shown are coplanar.	Perpendicular lines: $\overleftrightarrow{HM} \perp \overleftrightarrow{HL}$
G, H, and J are collinear.	Congruent angles: $\angle JHK \cong \angle GHM$
$\overleftrightarrow{HM}$, $\overleftrightarrow{HL}$, $\overleftrightarrow{HK}$, 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.	$\overline{HL} \cong \overline{HG}$

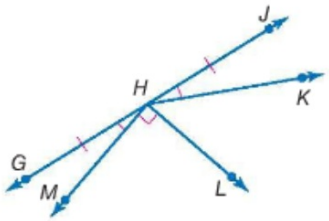


The list of statements that can be assumed is not a complete list.
There are more special pairs of angles than those listed.

NOT OK:Anything about lengths/ angles/congruence/ measurements (unless marked)

Example 4 Interpret Figures

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



Assume:
relationships

Not OK
lengths
angles
measurements
(unless marked)