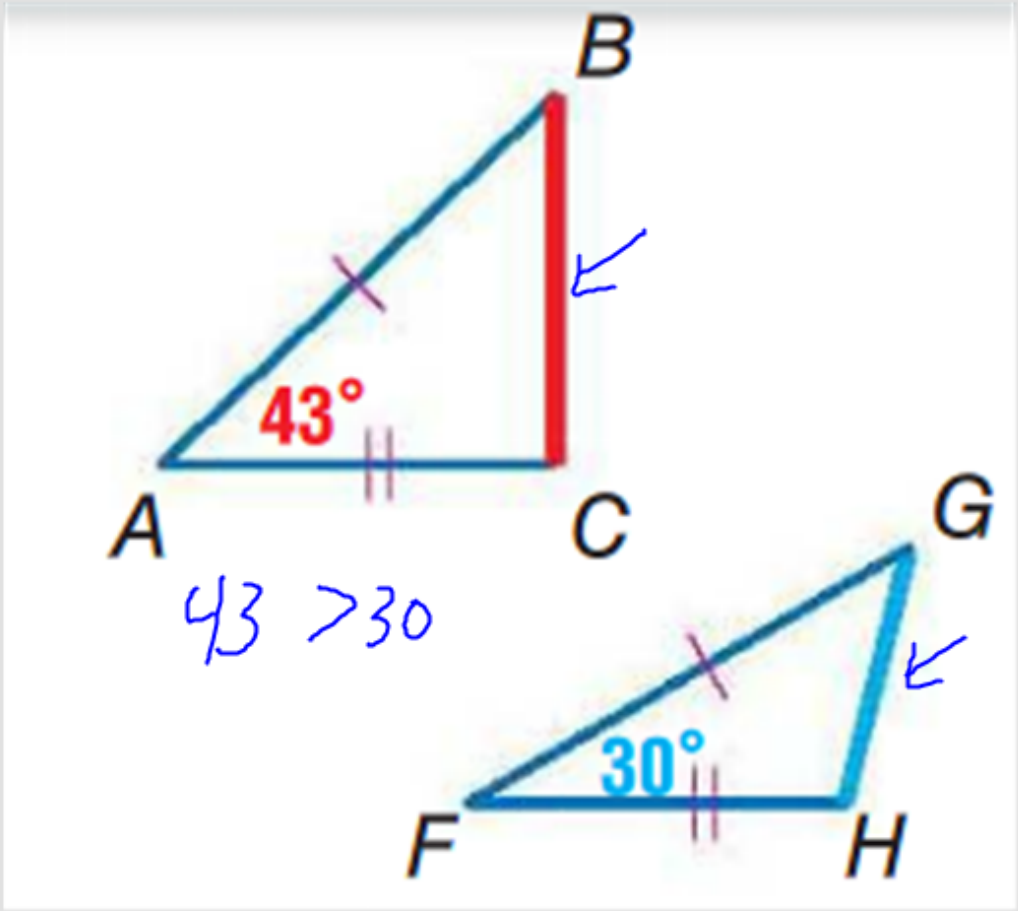
LESSON 5-6

Inequalities in Two Triangles

You will use the Hinge Theorem and its converse to make comparisons and prove triangle relationships

The Hinge Theorem



43 > 30

In 2 $\triangle$'s

If 2 pairs of $\cong$ sides

$\overline{AB} \cong \overline{FG}$

$\overline{AC} \cong \overline{FH}$

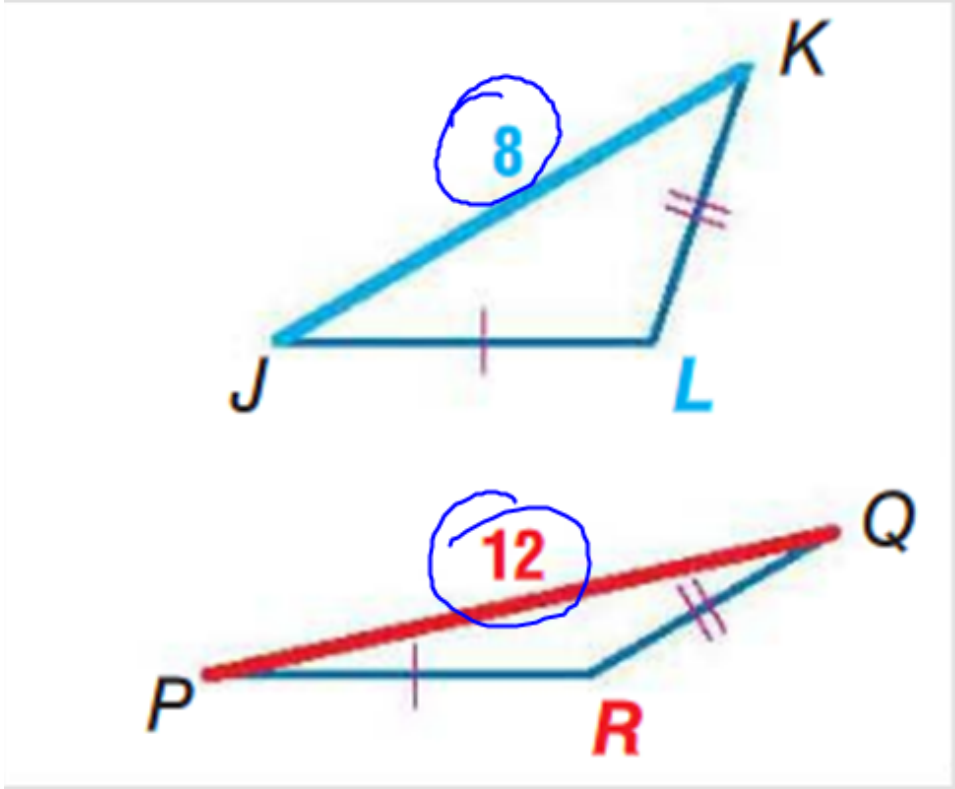
and if

$\angle A > \angle F$

then

$\rightarrow BC > GH$

Converse of the Hinge Theorem



2 pairs of $\cong$ sides

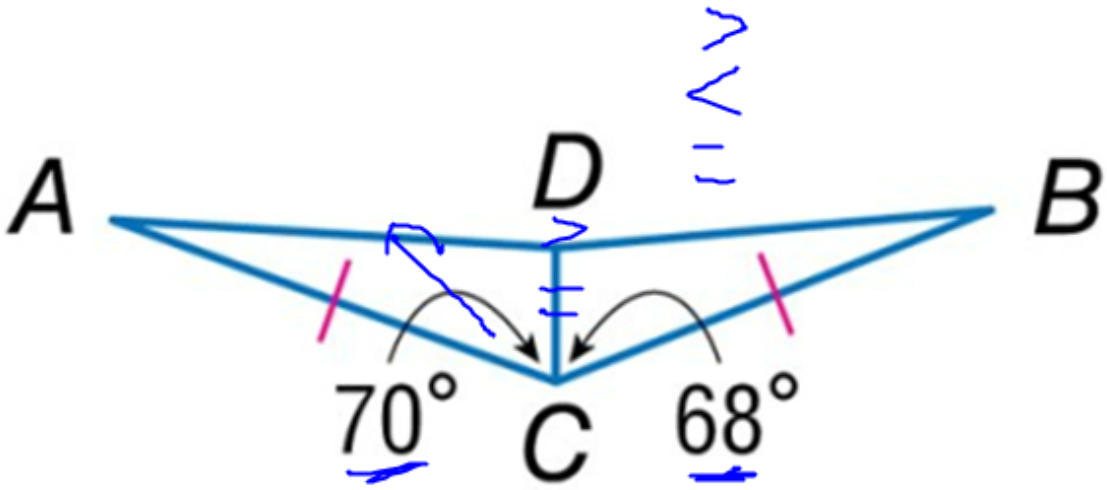
$\overline{JL} \cong \overline{PR}$, $\overline{KL} \cong \overline{QR}$

Angle R > Angle L

$\angle R > \angle L$

EXAMPLE 1 Use the Hinge Theorem and Its Converse

A. Compare the measures *AD* and *BD*.

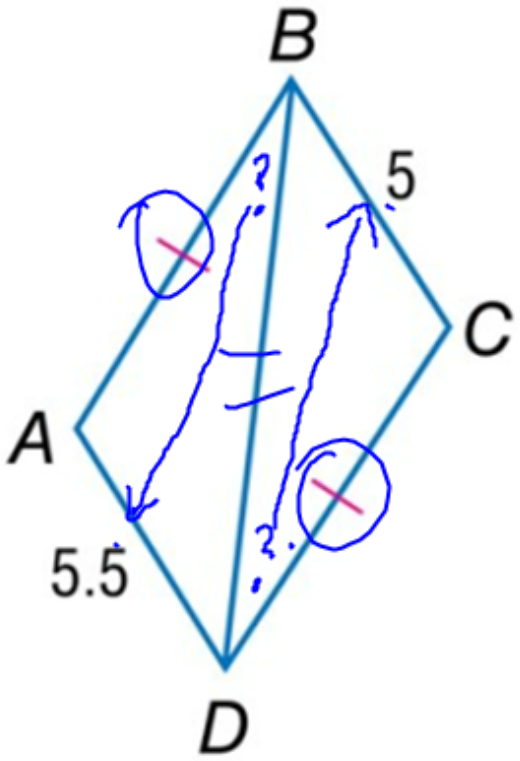


$AD > BD$

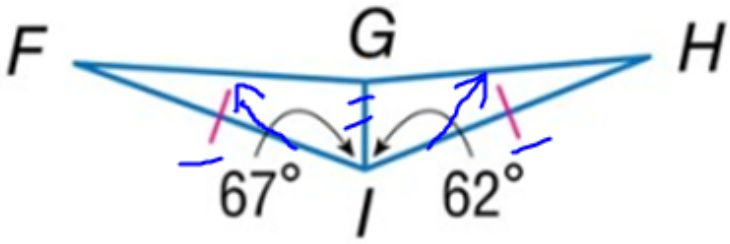
EXAMPLE 1 Use the Hinge Theorem and Its Converse

B. Compare the measures $m\angle ABD$ and $m\angle BDC$.

$m\angle ABD > m\angle BDC$



A. Compare the lengths of $\overline{FG}$ and $\overline{GH}$.



A. $FG > GH$

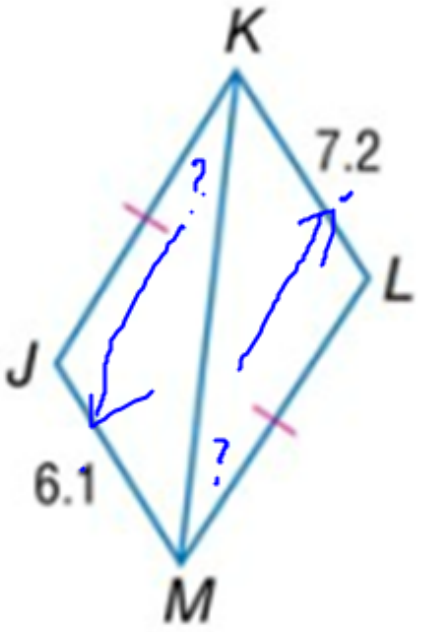
B. $FG < GH$

C. $FG = GH$

D. not enough information

EXAMPLE 1 Check Your Progress

B. Compare $m\angle JKM$ and $m\angle KML$.



A. $m\angle JKM > m\angle KML$

B. $m\angle JKM < m\angle KML$

C. $m\angle JKM = m\angle KML$

D. not enough information

Real-World Example 2

Check Your Progress

CheckPoint

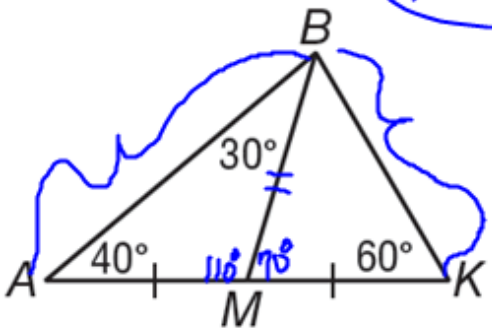
Meena and Rita are both flying kites in a field near their houses. Both are using strings that are 10 meters long. Meena's kite string is at an angle of 75° with the ground. Rita's kite string is at an angle of 65° with the ground. If they are both standing at the same elevation, which kite is higher in the air?

A. Meena's kite

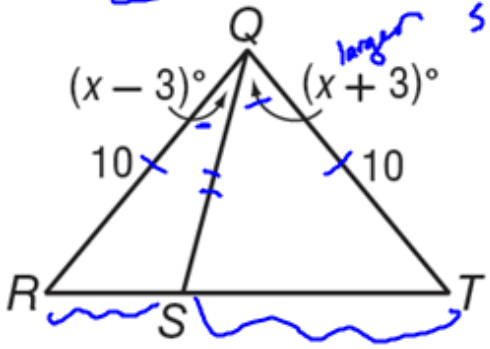
B. Rita's kite

Compare the given measures.

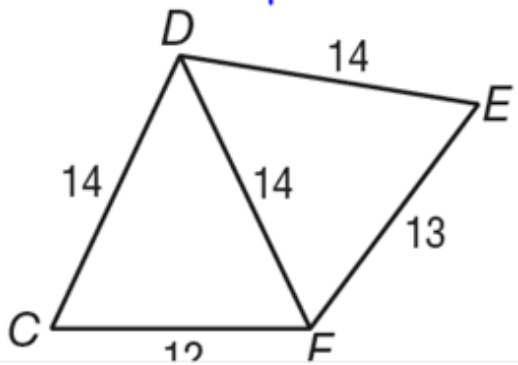
1. AB and BK



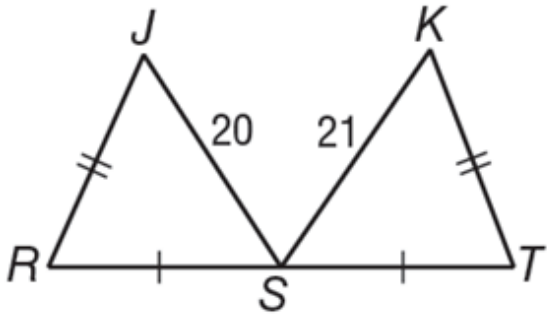
2. ST and SR



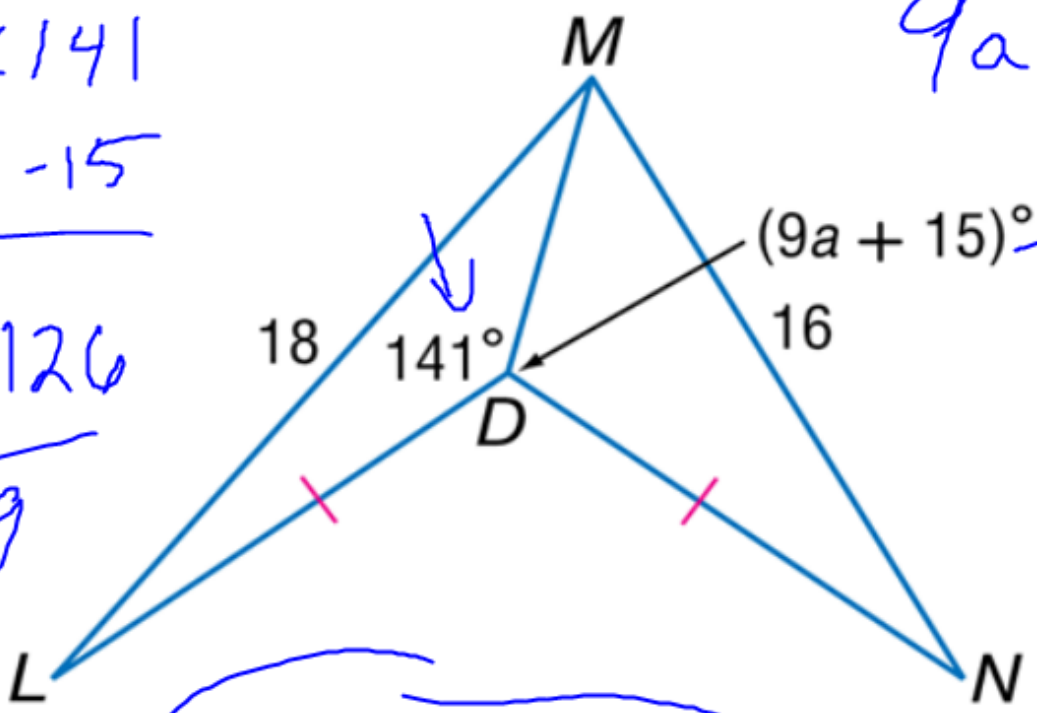
3. $m\angle CDF$ and $m\angle EDF$



4. $m\angle R$ and $m\angle T$



ALGEBRA **Find the range of possible values for *a*.**



Max

$9a + 15 < 141$

$-15 \quad -15$

$\frac{9a}{9} < \frac{126}{9}$

$a < 14$

Min

$9a + 15 > 0$

$-15 \quad -15$

$\frac{9a}{9} > \frac{-15}{9}$

$a > -\frac{5}{3}$

$-\frac{5}{3} < a < 14$

Practice
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#'s 1-5, 10-15, 17-20