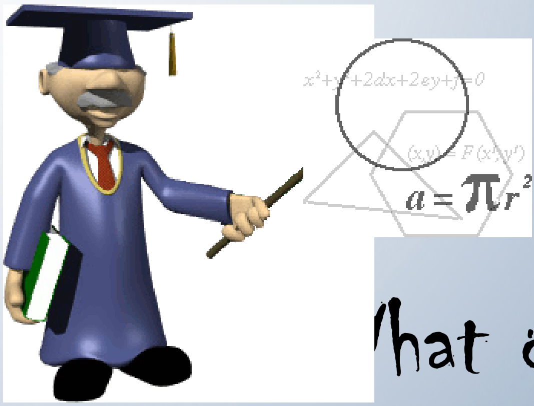
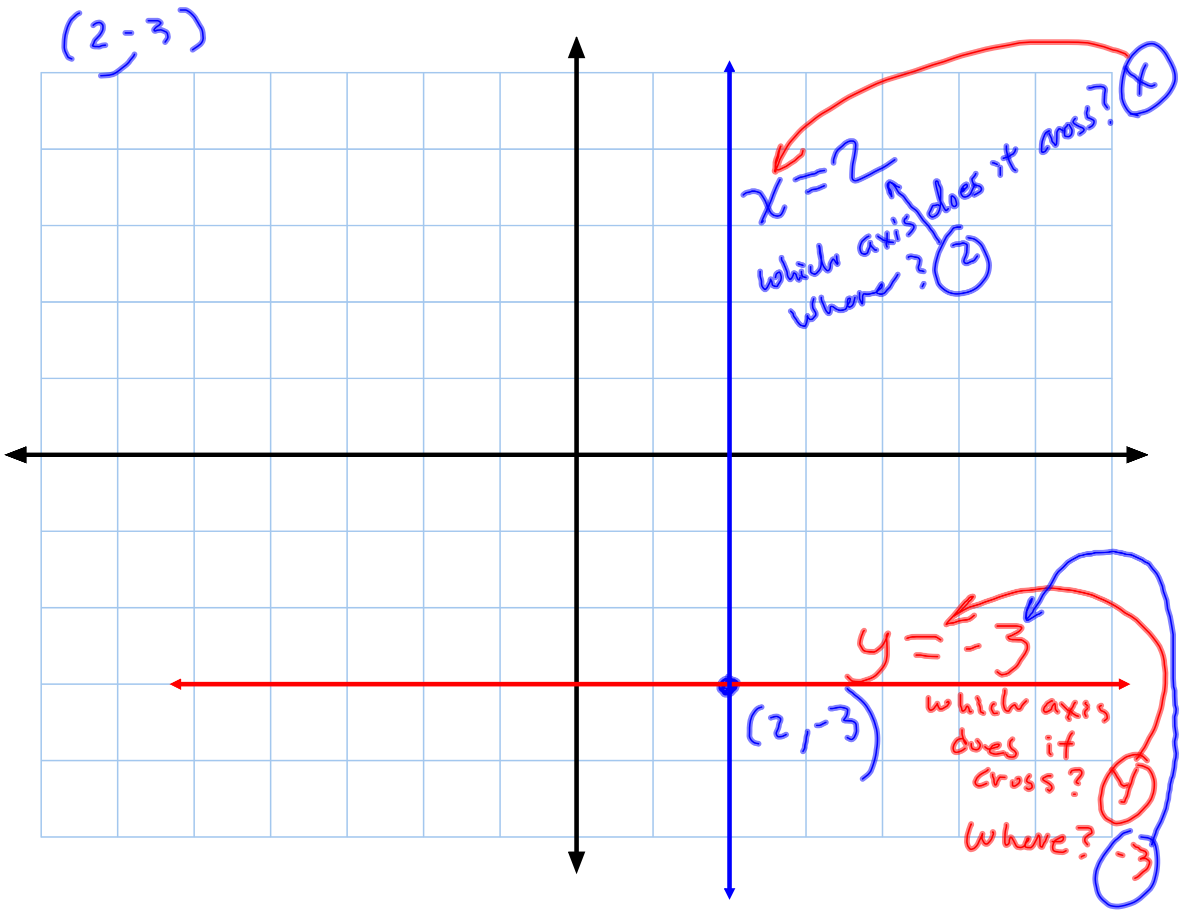


Warm up!

What do you think it means to say that two polygons are congruent?



n # sides

each ∠ = 120°
n of them...

$$(n-2)180 = 120n$$

$$180n - 360 = 120n$$

$$60n = 360$$

$$n = 6$$

$$1\angle = 120^\circ$$

$$m = 6$$

$$(x_1, y_1) = (-3, 5)$$

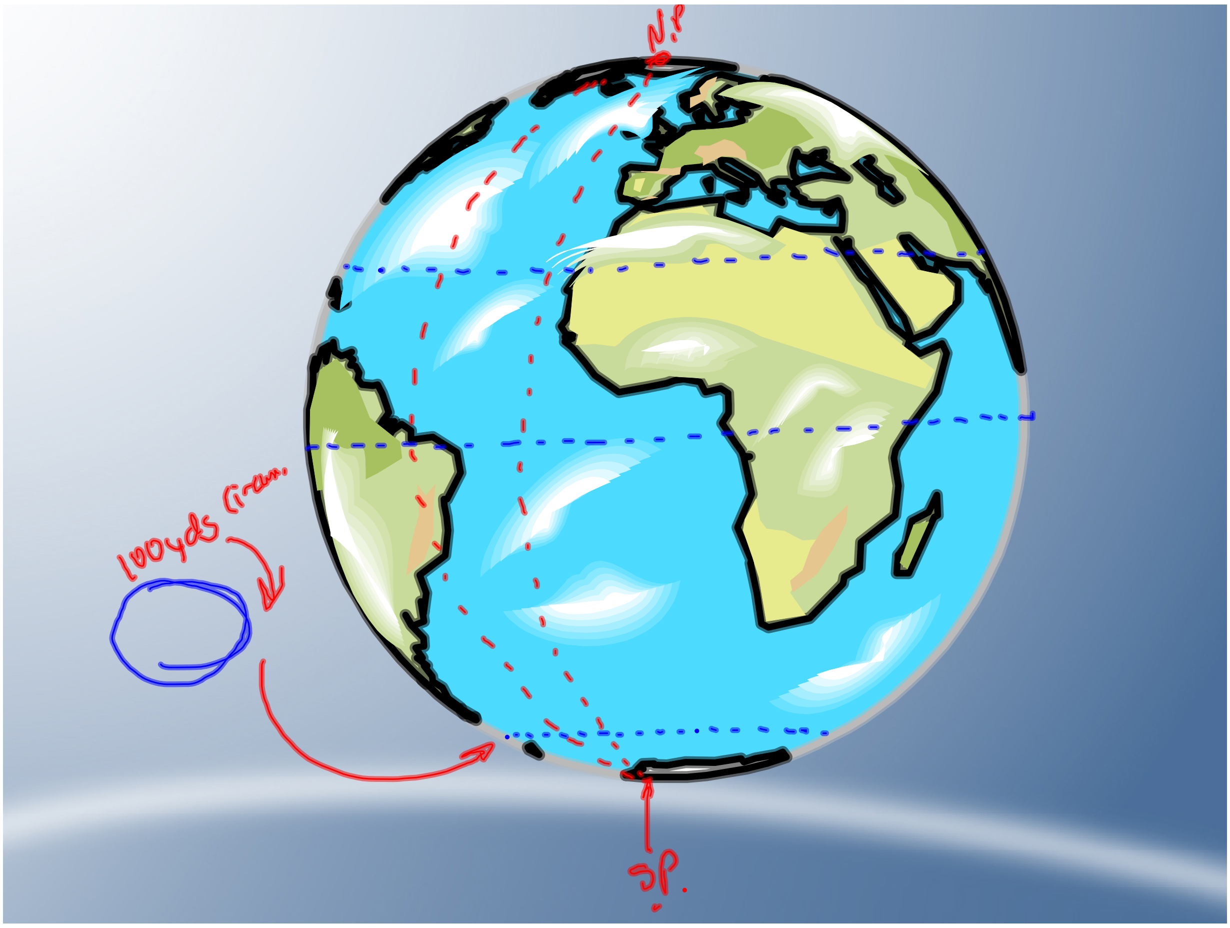
$$y - y_1 = m(x - x_1)$$

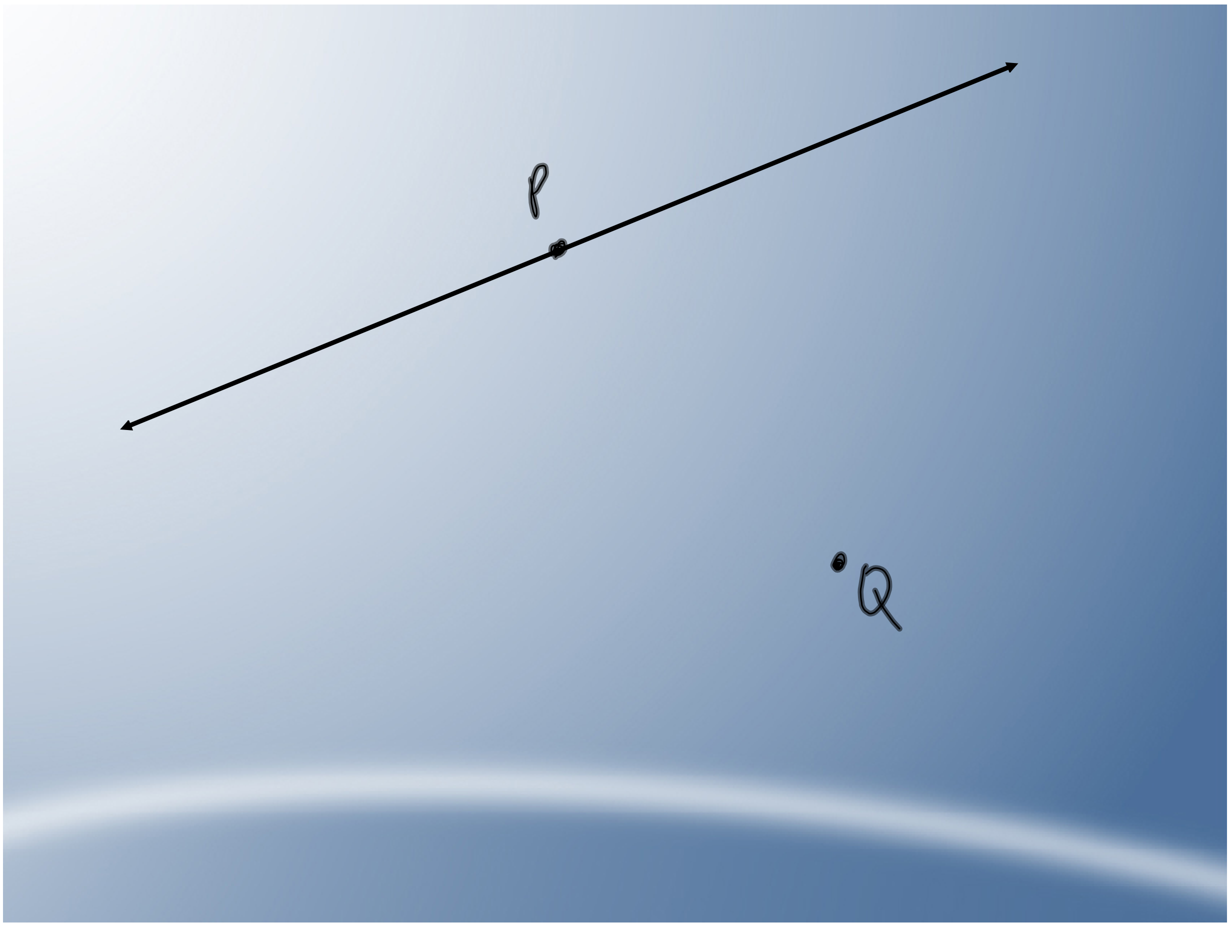
$$y - 5 = 6(x + 3)$$

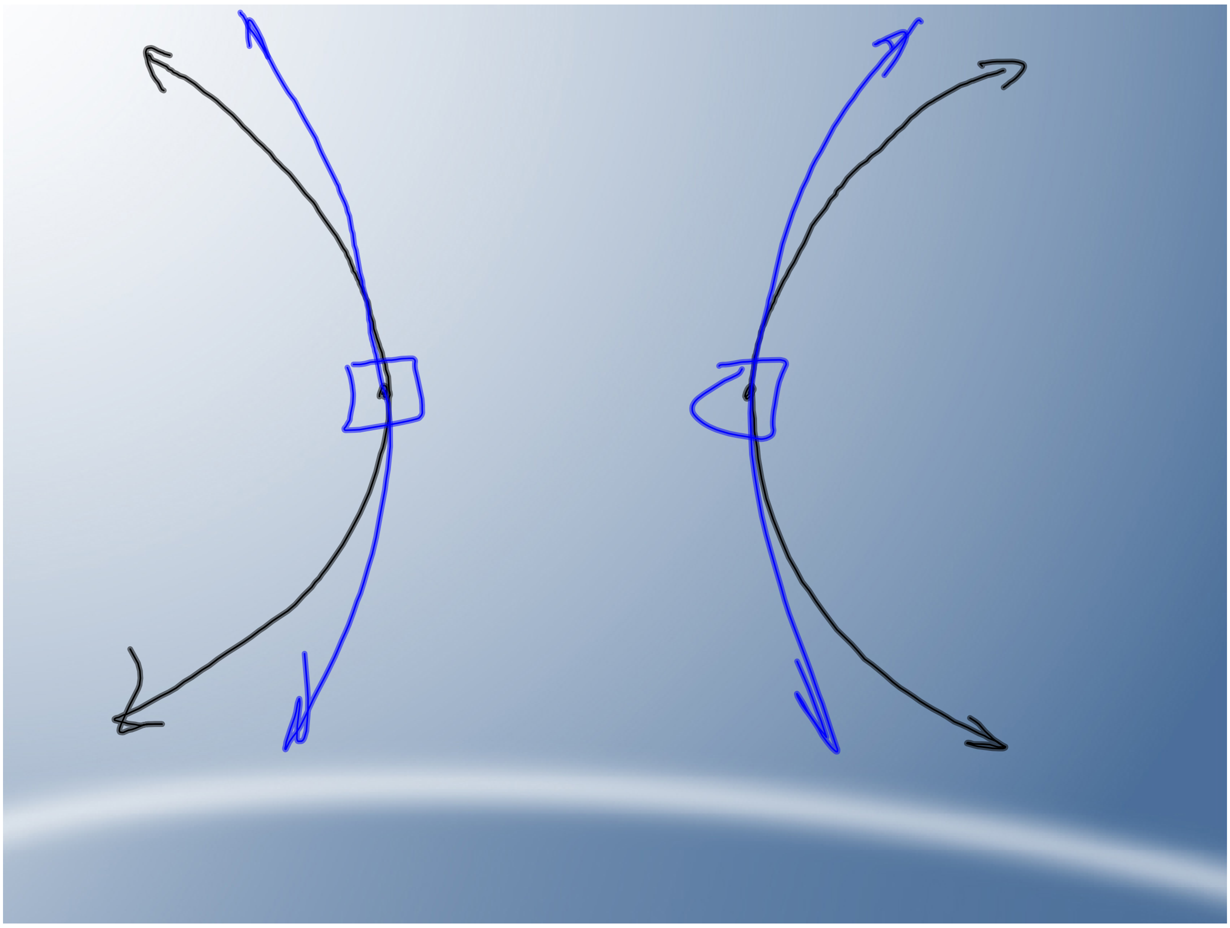
$$y - 5 = 6x + 18$$

$$+5 \qquad +5$$

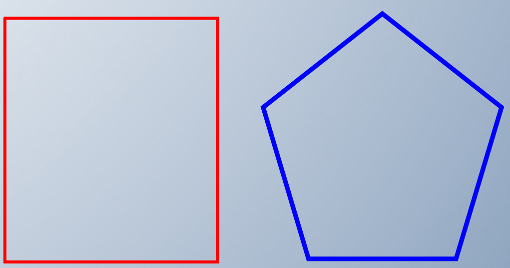
$$y = 6x + 23$$


N.P
100yds circum.
S.P.

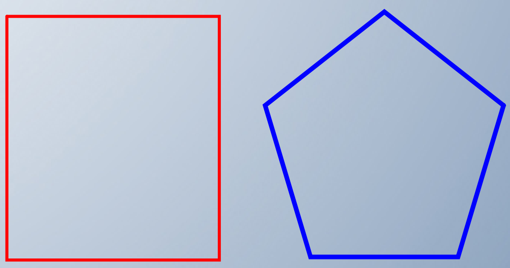

P
Q



Are these polygons congruent?

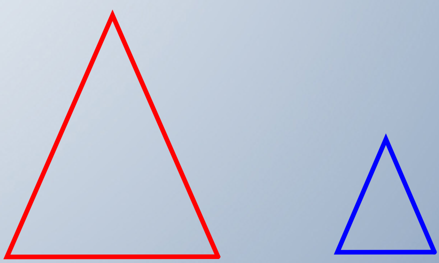


Are these polygons congruent?

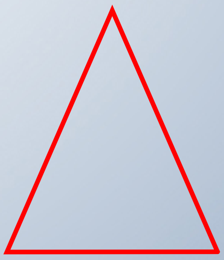


Nope...they're different shapes...

Are these polygons congruent?

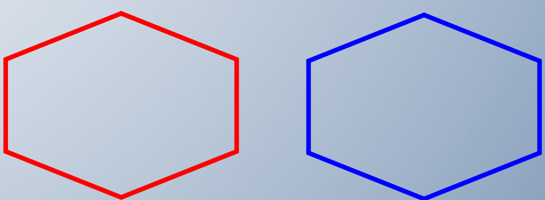


Are these polygons congruent?

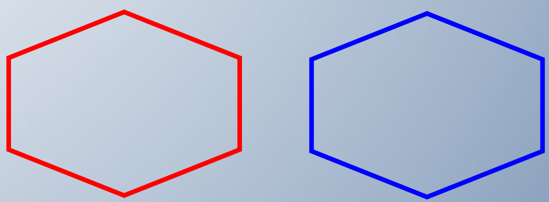


Nope...they're same shape, but different sizes...

Are these polygons congruent?

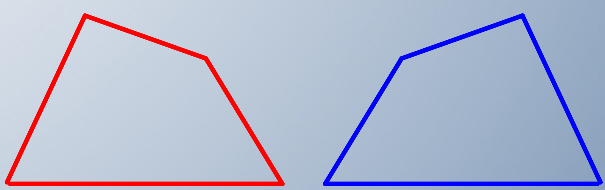


Are these polygons congruent?

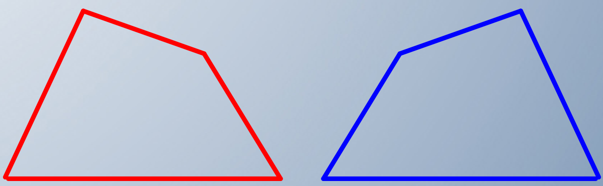


Yup…they're same shape, <u>and</u> same size…

Are these polygons congruent?



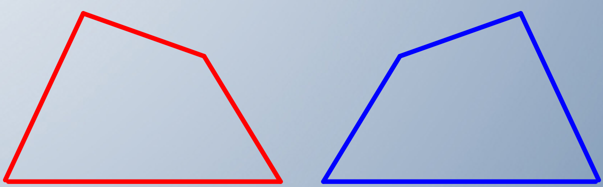
Are these polygons congruent?



Yup…they're same shape, <u>and</u>

same size…

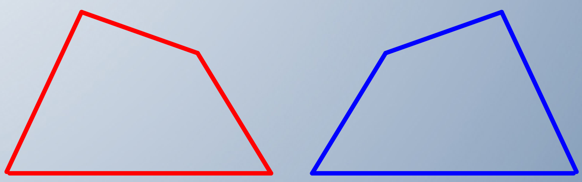
Are these polygons congruent?



Yup…they're same shape, <u>and</u>

same size…

Are these polygons congruent?



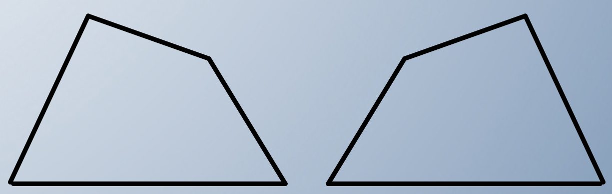
Yup...they're same shape, and same size...fit exactly on each other.

Are these polygons congruent?

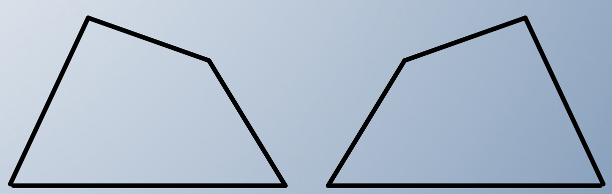
Yup...they're same shape, and same size...fit exactly on each other.

Not a very satisfying definition is it?

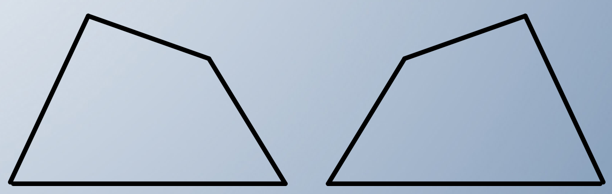
How could we more precisely (mathematically) state why these figures are congruent?

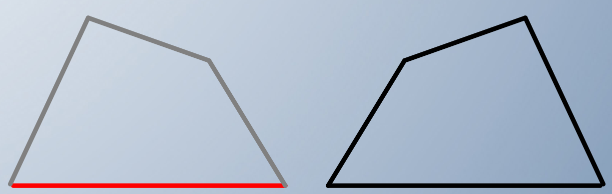


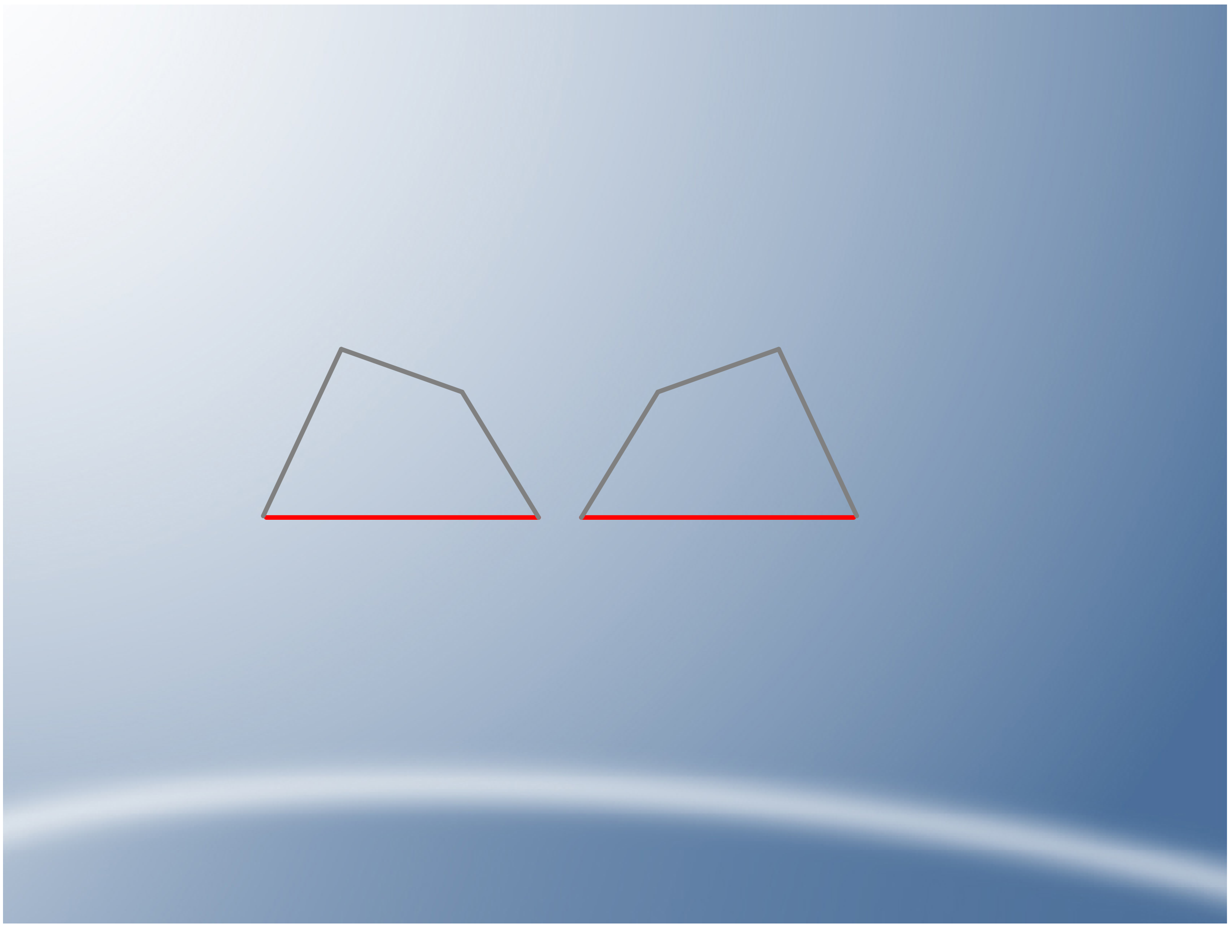
Let's identify how parts of these figures pair up...

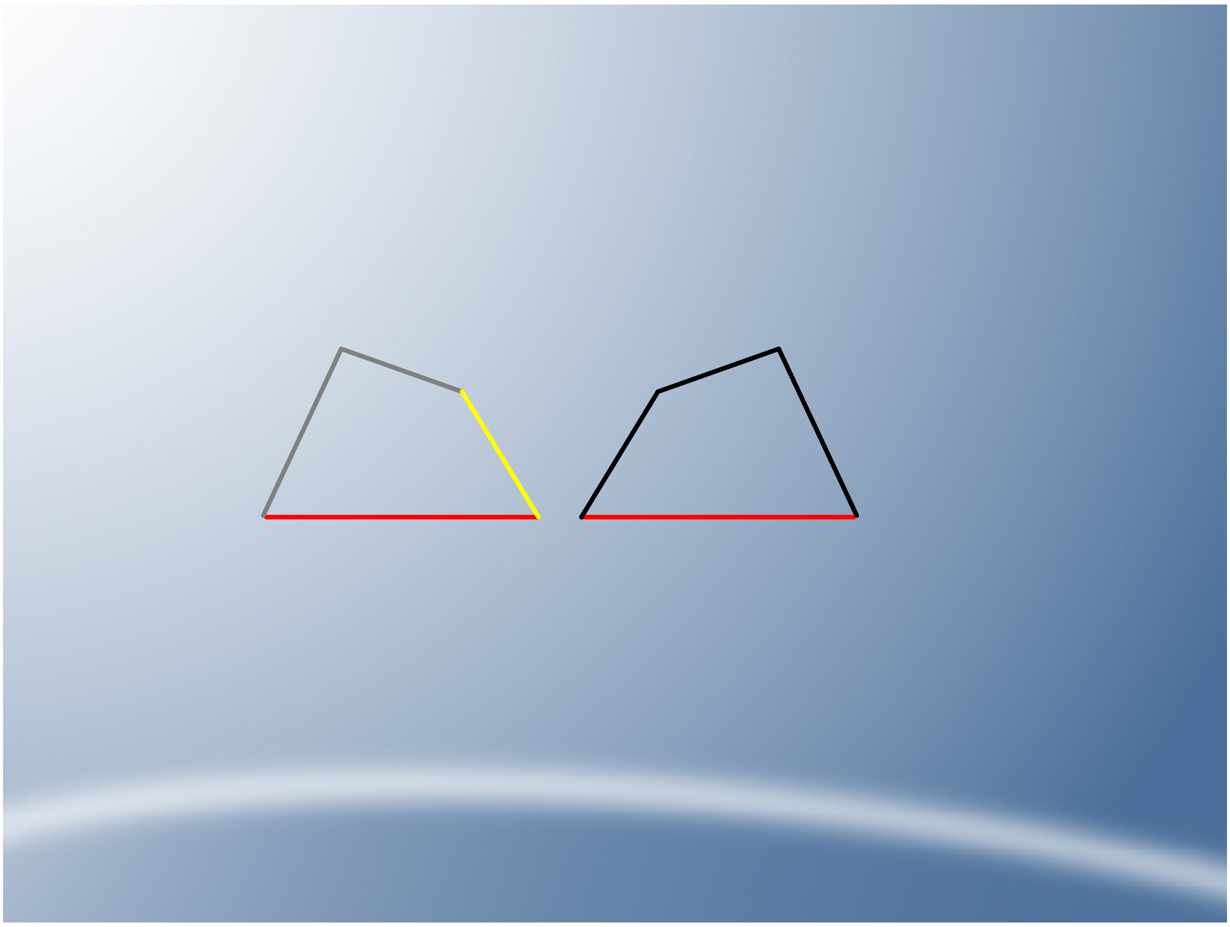


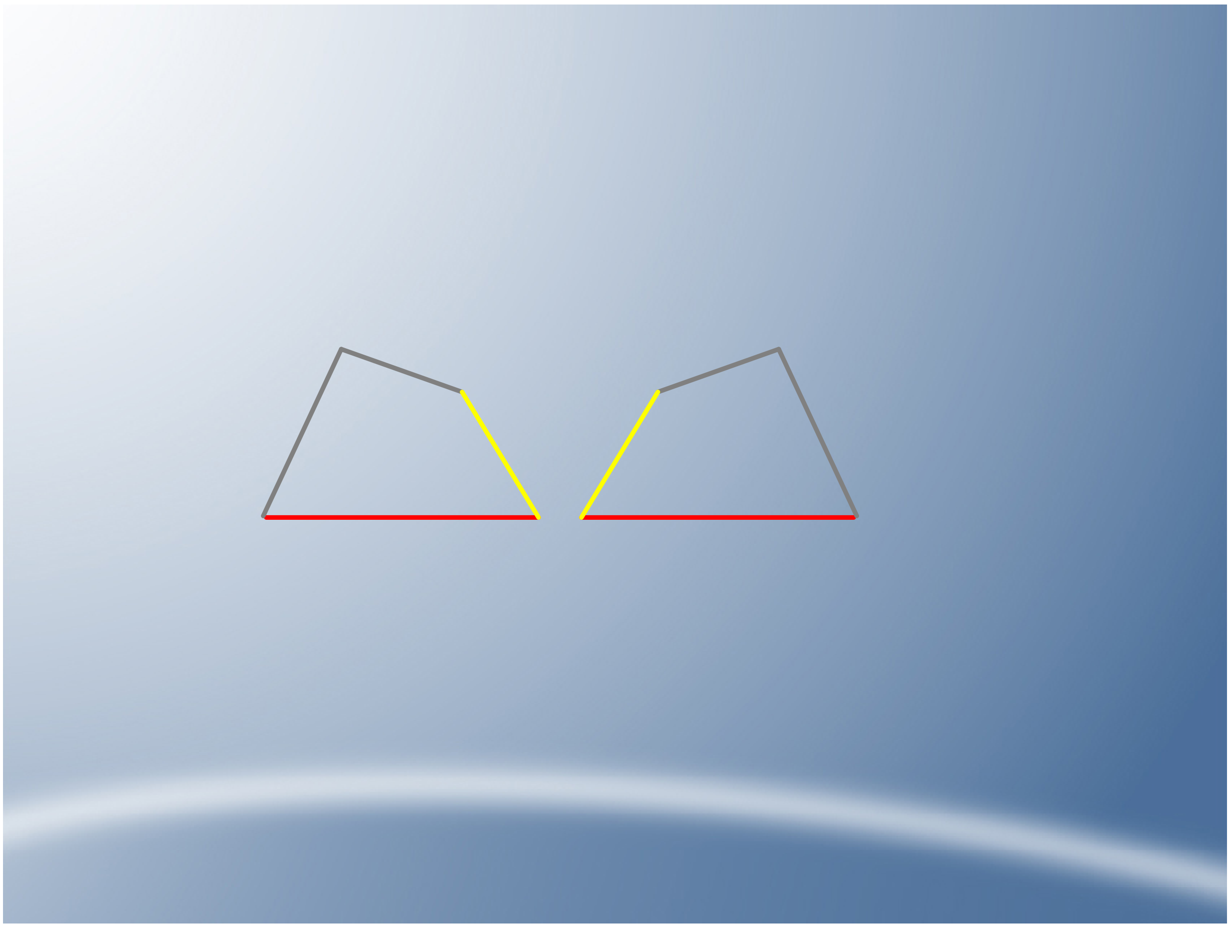
Let's identify how parts of these figures pair up...
their corresponding parts...

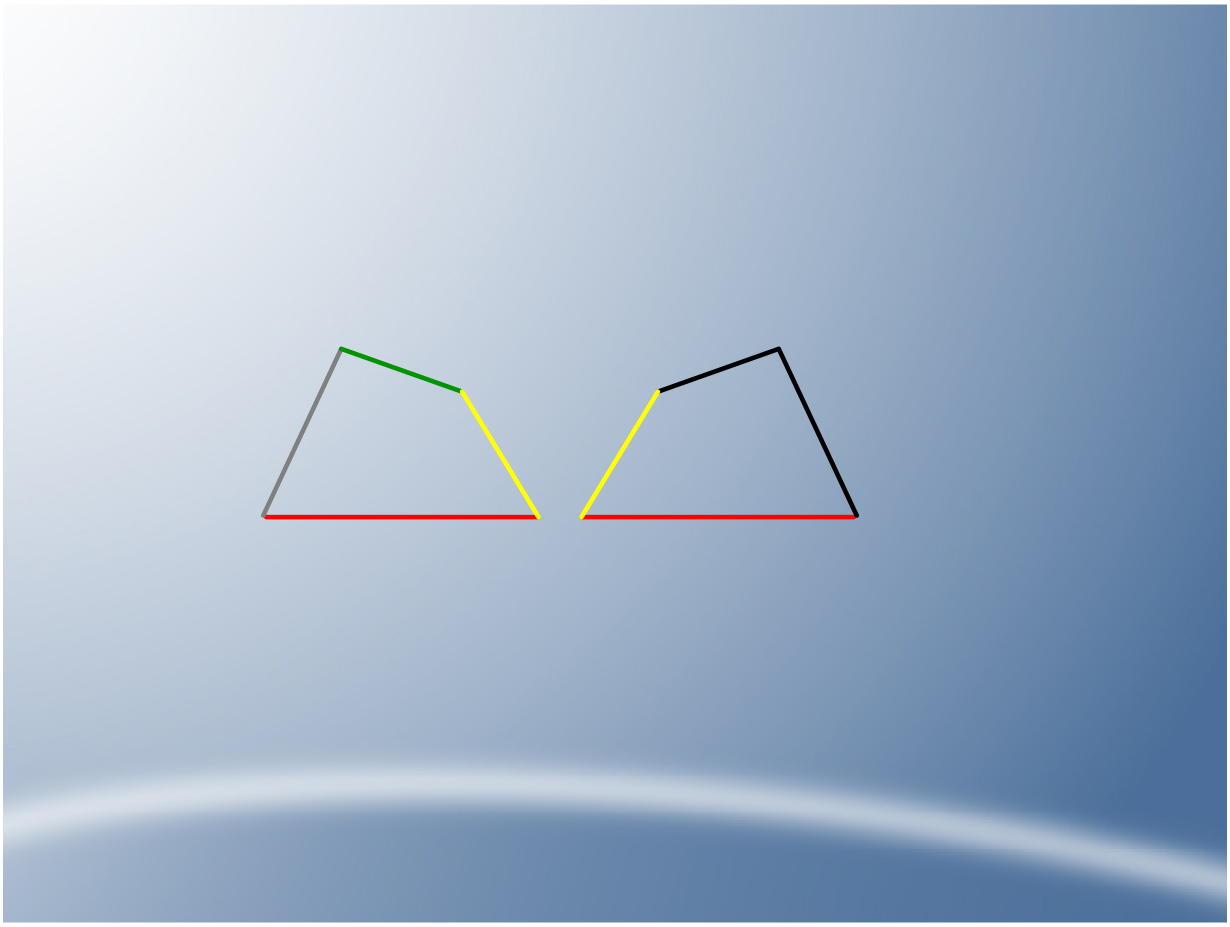


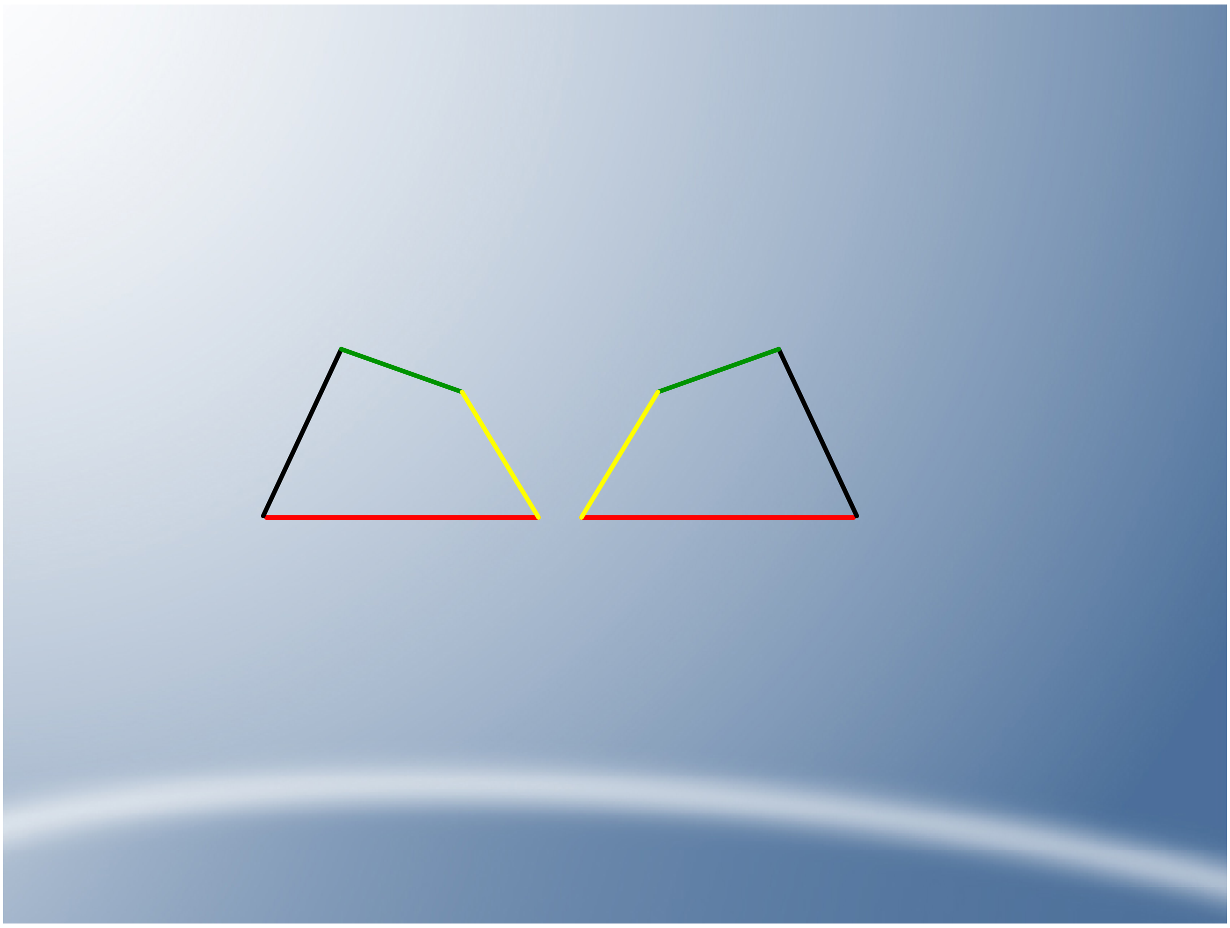


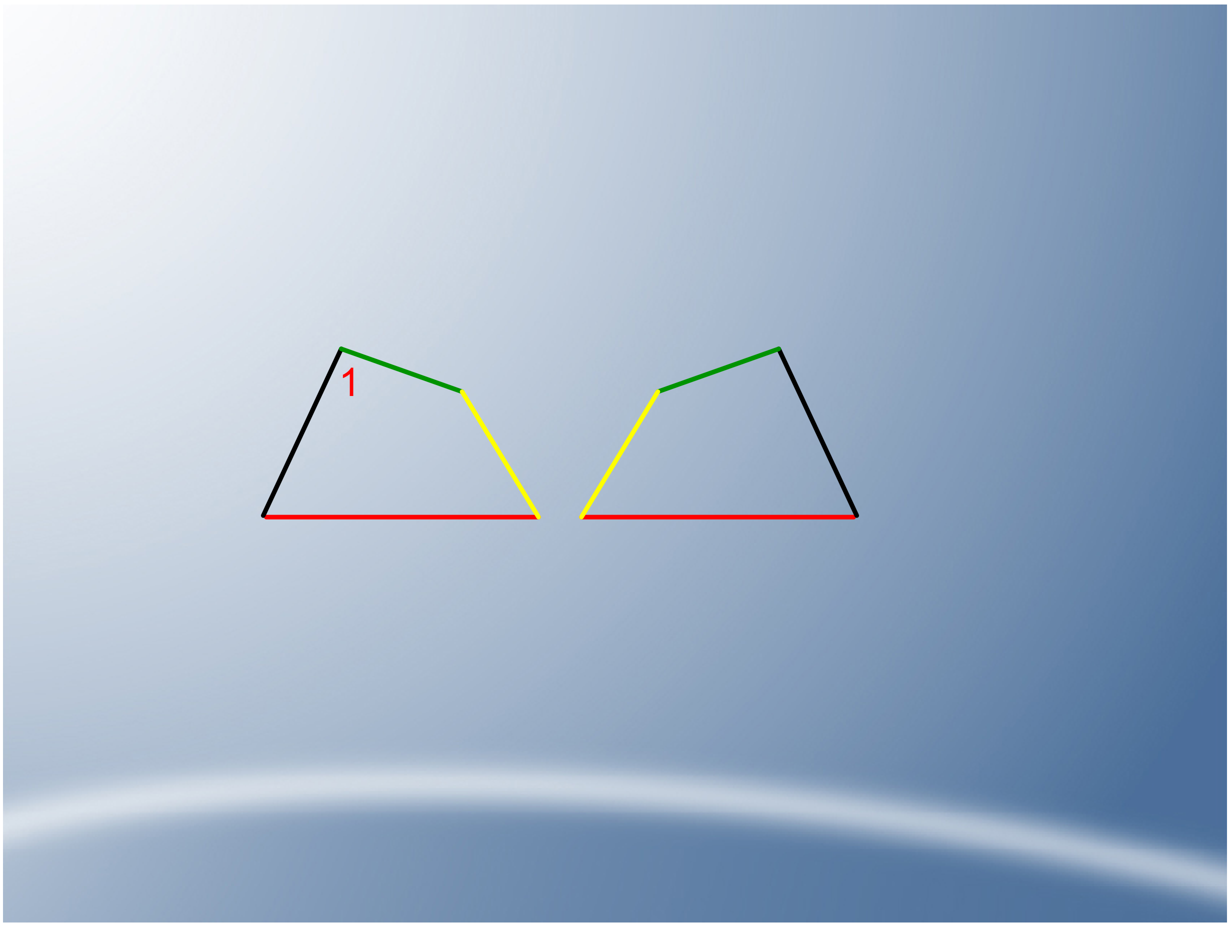


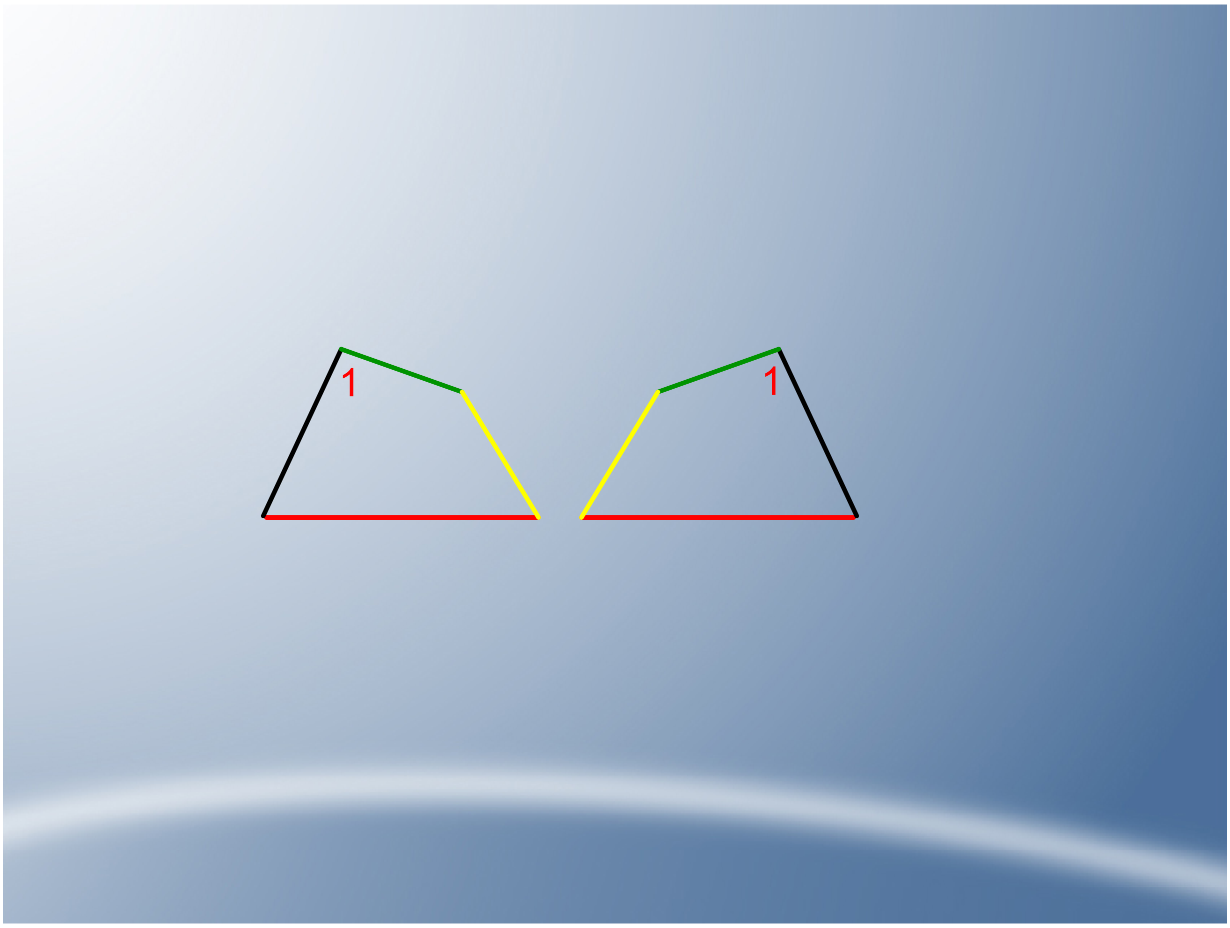


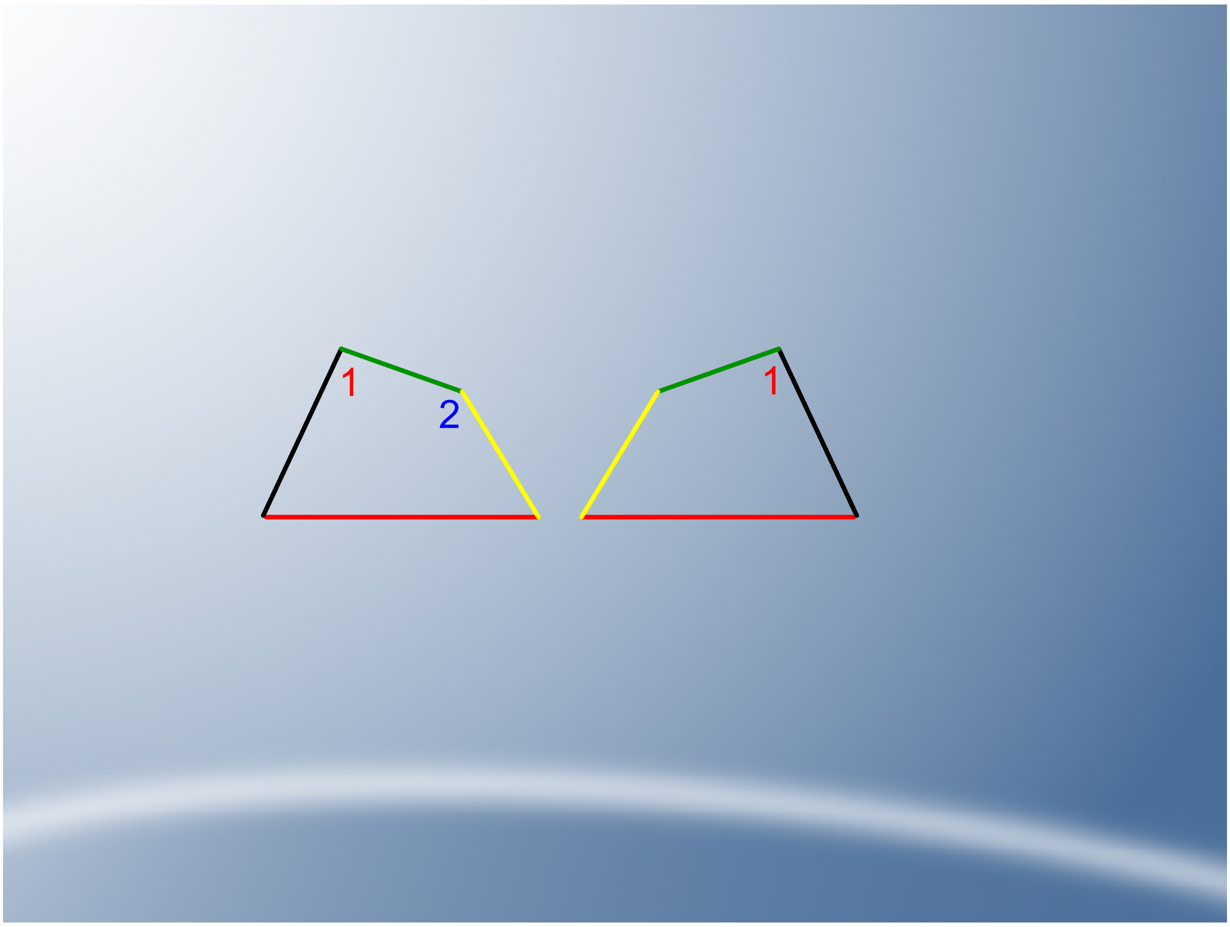


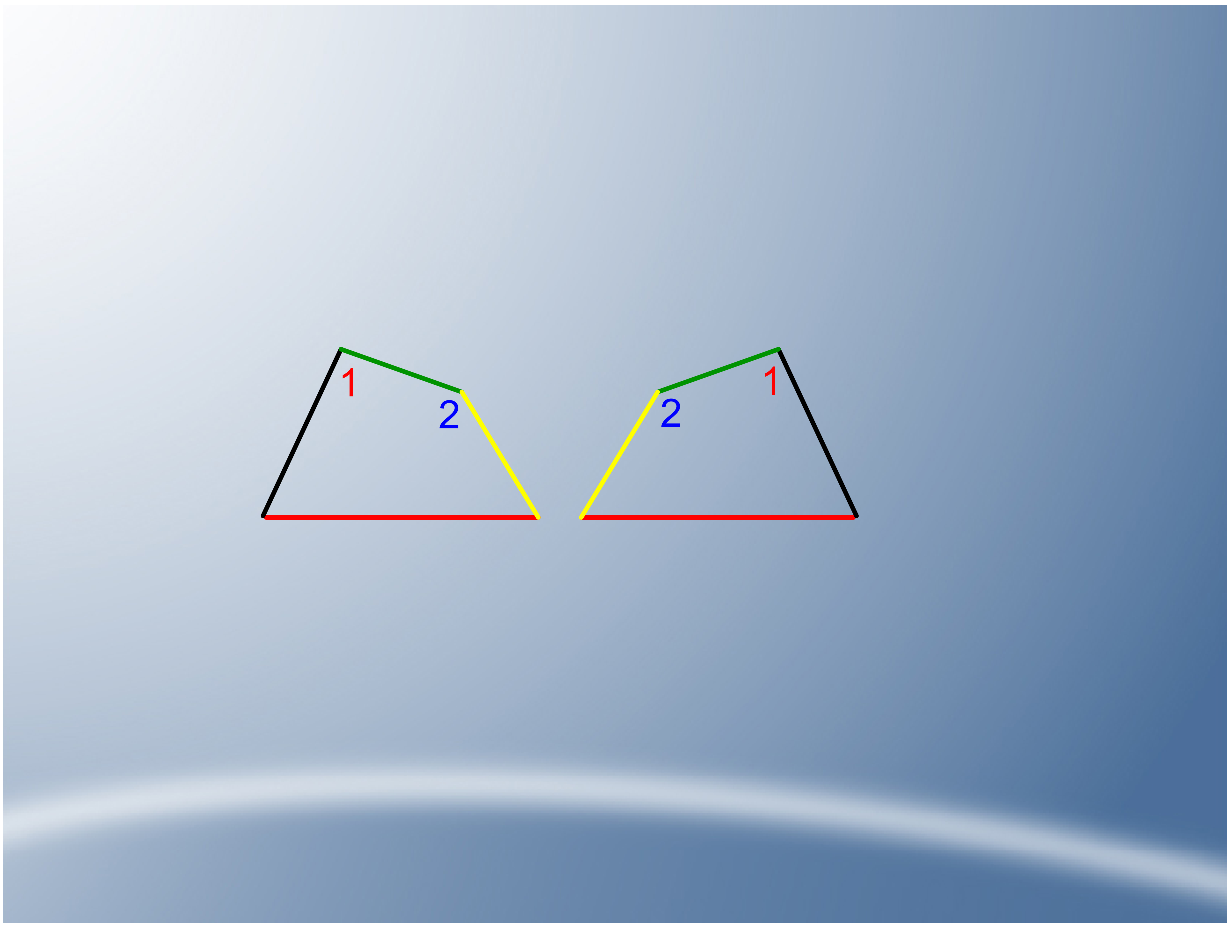


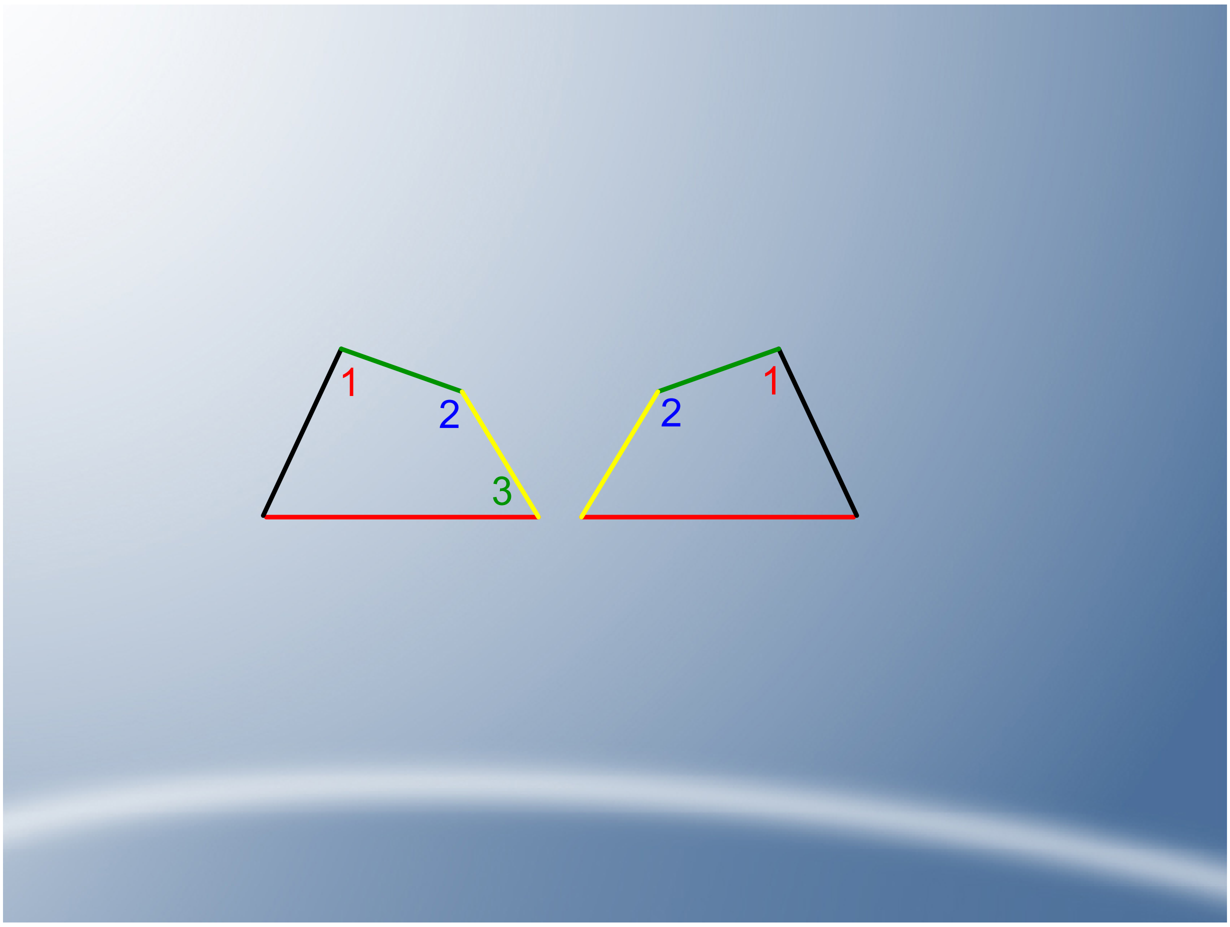


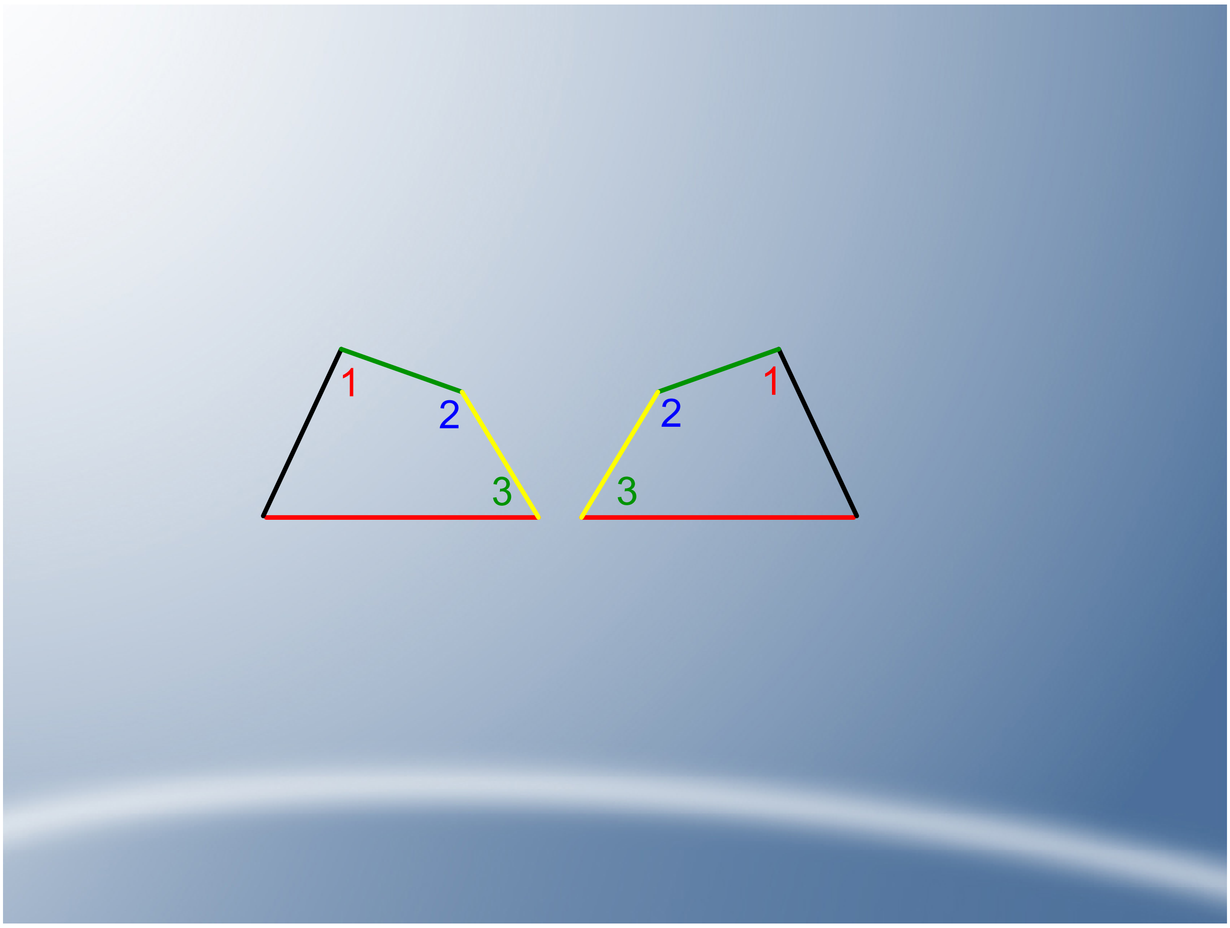

1

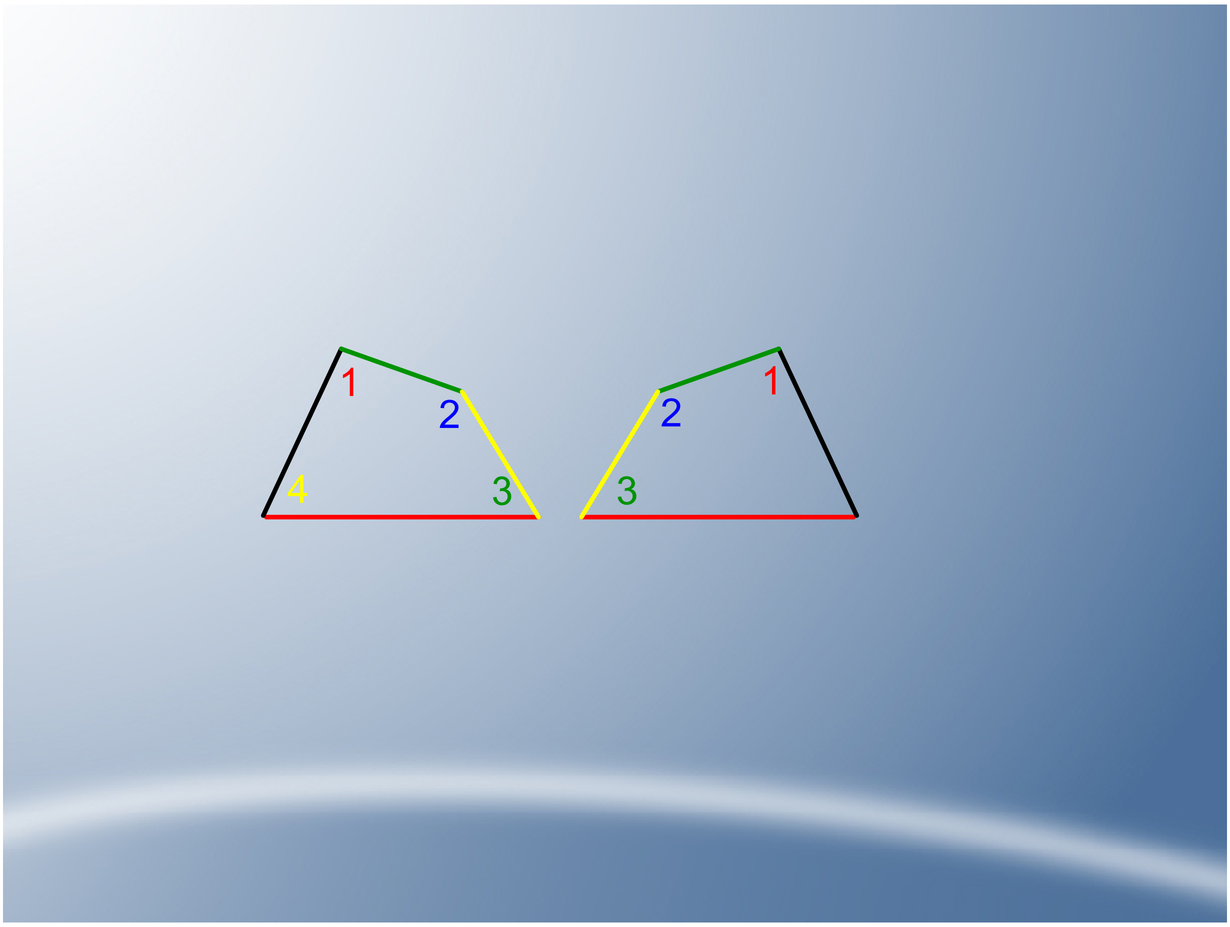

1
1

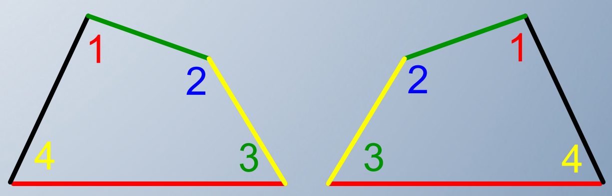

1
2
1


1
2
2
1

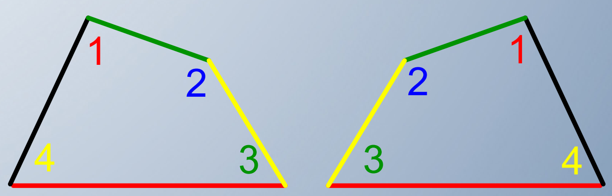

1
2
3
2
1


1
2
3
1
2
3

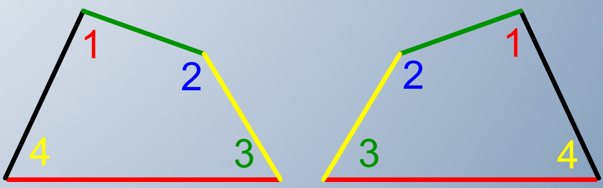

1
2
3
4
1
2
3



Are these polygons congruent?

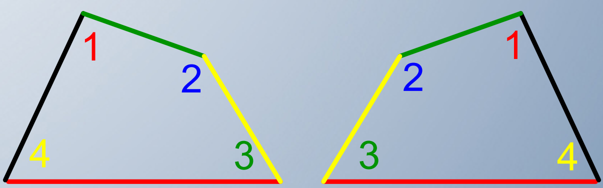


Are these polygons congruent?



Yes, because all corresponding parts are congruent

Are these polygons congruent?



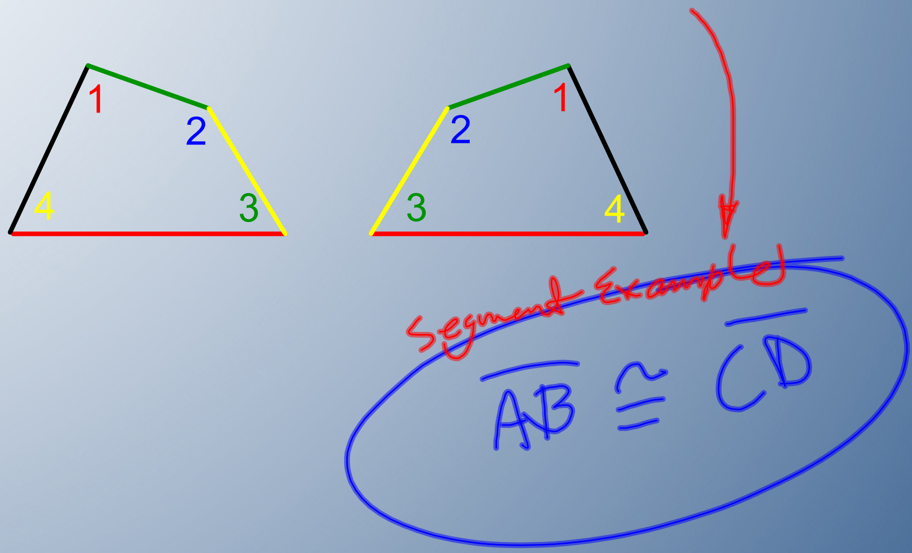
Yes, because all corresponding parts (sides/angles) are congruent

Definition: Congruent Polygons

Two polygons are congruent ***iff*** all corresponding parts are congruent.

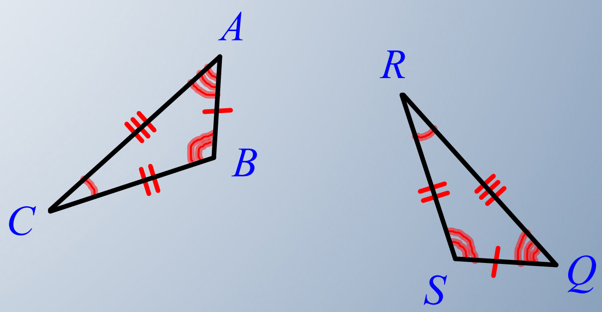
How could we write a statement that said these 2 polys are $\cong$?

How could we write a statement that said these 2 polys are ≅? ... **a congruence statement** ...

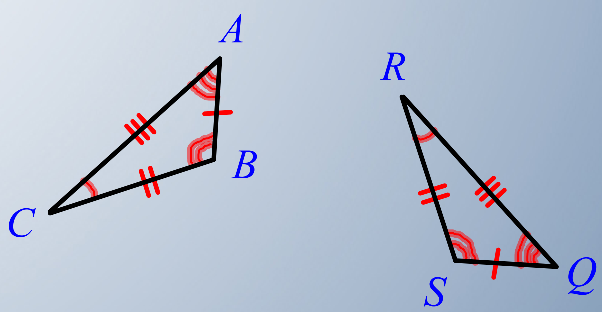


When you write a congruent statement,
list corresponding vertices in the same order.

When you write a congruent statement,
list corresponding vertices in the same order.

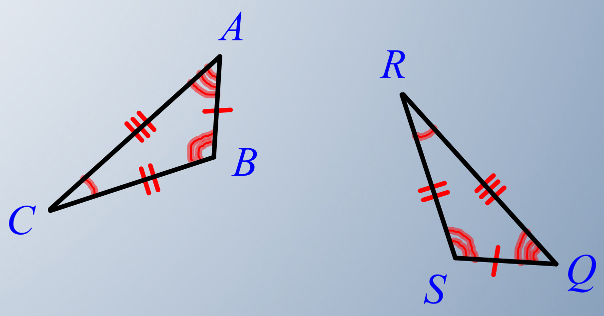


When you write a congruent statement,
list corresponding vertices in the same order.



Δ _ _ _ $\cong$ Δ _ _ _

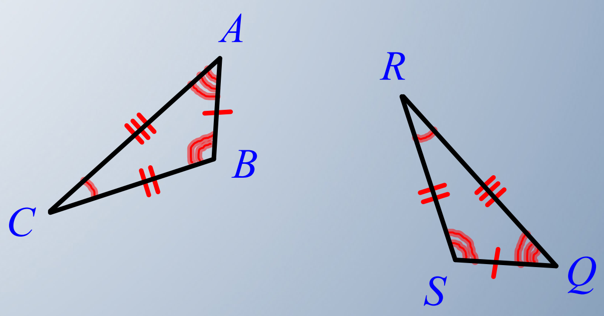
When you write a congruent statement,
list corresponding vertices in the same order.



$\angle A \cong$

$\Delta\_\,\_\,\_ \cong \Delta\_\,\_\,\_$

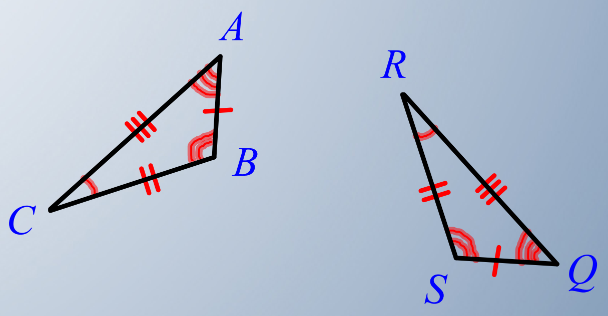
When you write a congruent statement,
list corresponding vertices in the same order.



$\angle A \cong \angle Q$

$\Delta\_\,\_\,\_ \cong \Delta\_\,\_\,\_$

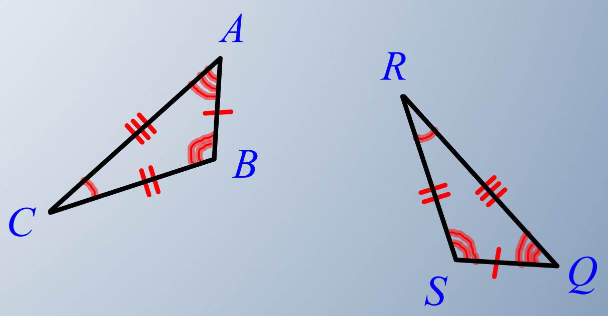
When you write a congruent statement, list corresponding vertices in the same order.



$\angle A \cong \angle Q$

$\Delta A\_\_ \cong \Delta Q\_\_$

When you write a congruent statement, list corresponding vertices in the same order.

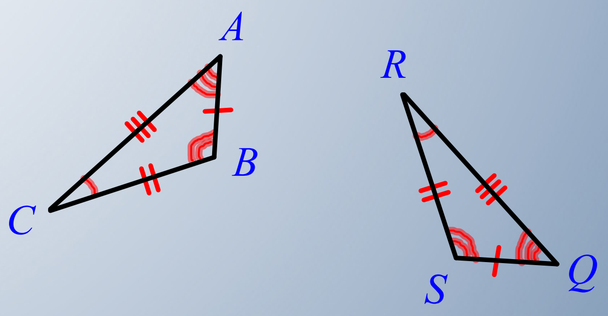


$\angle A \cong \angle Q$

$\angle B \cong$

$\Delta A\_\_ \cong \Delta Q\_\_$

When you write a congruent statement,
list corresponding vertices in the same order.

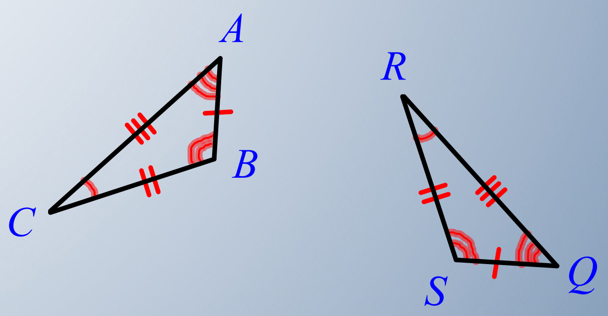


$\angle A \cong \angle Q$

$\angle B \cong \angle S$

$\Delta A\_\,\_ \cong \Delta Q\_\,\_$

When you write a congruent statement,
list corresponding vertices in the same order.

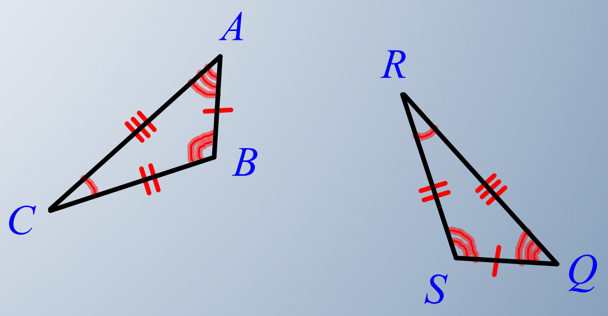


$\angle A \cong \angle Q$

$\angle B \cong \angle S$

$\Delta AB\_ \cong \Delta QS\_$

When you write a congruent statement,
list corresponding vertices in the same order.



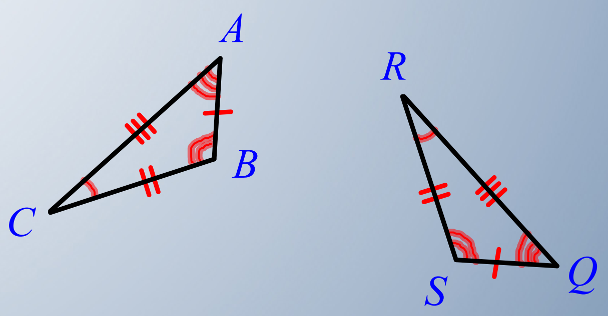
$\angle A \cong \angle Q$

$\angle B \cong \angle S$

$\angle C \cong$

$\Delta AB\_ \cong \Delta QS\_$

When you write a congruent statement,
list corresponding vertices in the same order.



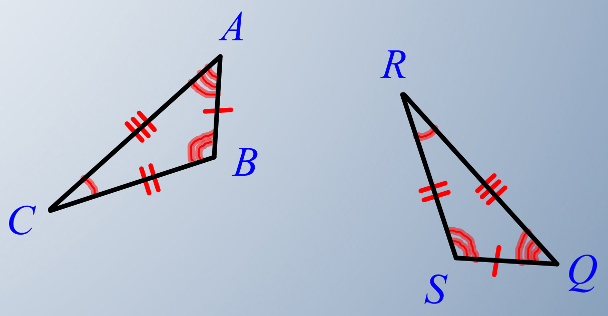
$\angle A \cong \angle Q$

$\angle B \cong \angle S$

$\angle C \cong \angle R$

$\Delta AB\_ \cong \Delta QS\_$

When you write a congruent statement,
list corresponding vertices in the same order.



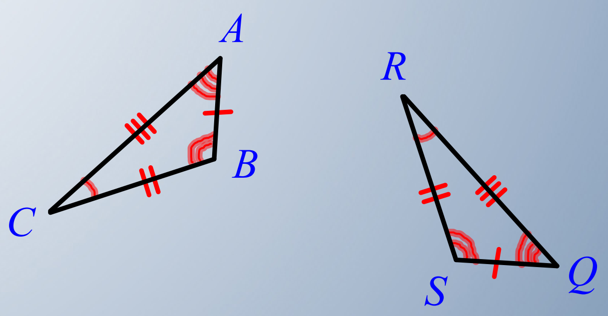
$\angle A \cong \angle Q$

$\angle B \cong \angle S$

$\angle C \cong \angle R$

$\Delta ABC \cong \Delta QSR$

When you write a congruent statement,
list corresponding vertices in the same order.



$\angle A \cong \angle Q$

$\angle B \cong \angle S$

$\angle C \cong \angle R$

$$\Delta ABC \cong \Delta QSR$$

~~$\Delta ABC \cong \Delta SQR$~~ ? No!

Didn't match up corresponding parts.

Given $\Delta NWD \cong \Delta RPK$,
list the $\cong$ corresponding parts.

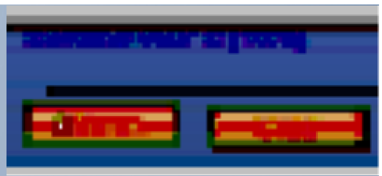
$\angle N \cong \angle R$ $\quad$ $\overline{NW} \cong \overline{RP}$

$\angle W \cong \angle P$ $\quad$ $\overline{WD} \cong \overline{PK}$

$\angle D \cong \angle K$ $\quad$ $\overline{ND} \cong \overline{RK}$

---

1 If $BOLT \cong SIDE$, which part of $SIDE$ corresponds to $\overline{BT}$?



A $\overline{SI}$

B $\overline{SD}$

C $\overline{SE}$

D $\overline{ID}$

E $\overline{IE}$

F $\overline{DE}$

G none

H not enough info

$\overline{BT} \cong \overline{SE}$

2 Which Δ is ≅ to Δ*ABC*?

[redacted]

A ΔCED

B ΔCDE

C ΔECD

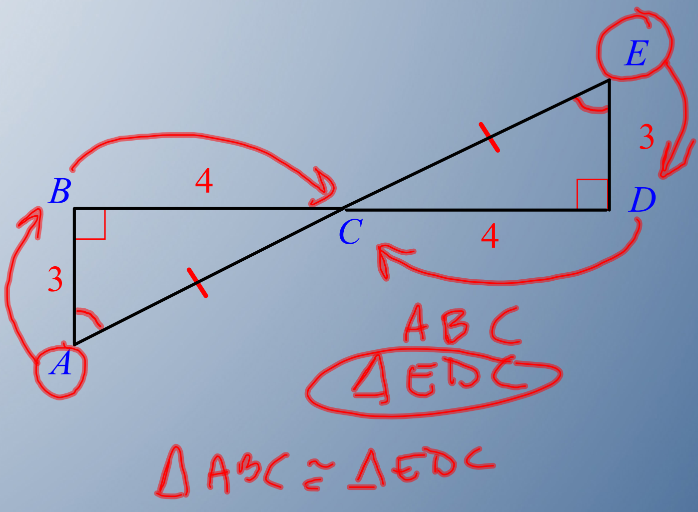
D ΔEDC

E ΔDEC

F ΔDCE

G none

H not enough info



3 Which Δ is ≅ to Δ*JLK*?

[redacted]

A ΔLNM

B ΔLMN

C ΔNLM

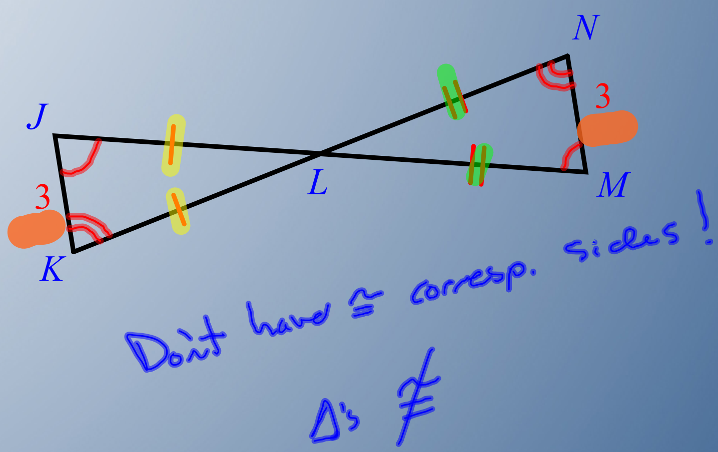
D ΔNML

E ΔMNL

F ΔMLN

G none

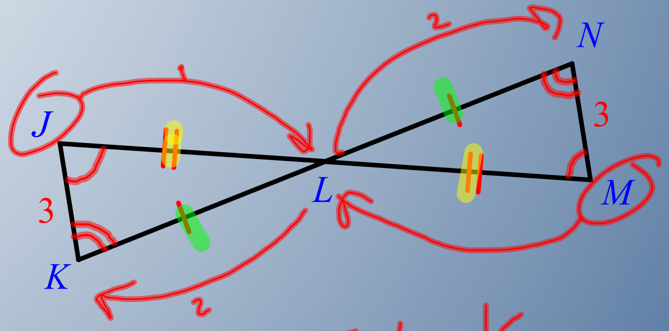
H not enough info



4 **Now which Δ is ≅ to Δ*JLK*?**

[redacted]

A ΔLNM
B ΔLMN
C ΔNLM
D ΔNML
E ΔMNL
F ΔMLN
G none
H not enough info

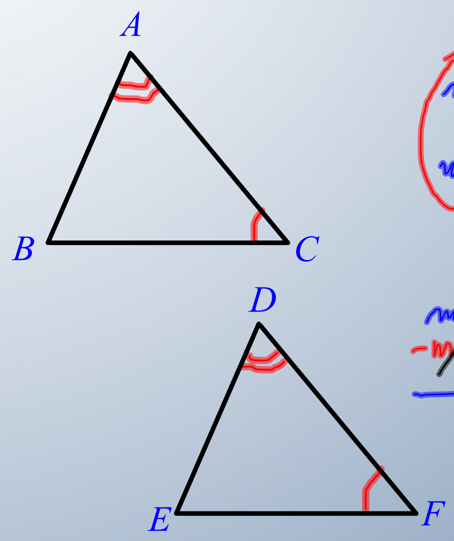


J L K
M L N

ΔJLK ≅ ΔMLN

Given ∠*A* ≅ ∠*D* and ∠*C* ≅ ∠*F*, what would you conjecture about ∠*B* & ∠*E*?

Conj: ∠B ≅ ∠E



m∠A + m∠B + m∠C = 180 Given
≅ ≅ ≅
m∠D + m∠E + m∠F = 180 Given

m∠A + m∠B + m∠C = m∠D + m∠E + m∠F Refx POE
−m∠A −m∠C −m∠A −m∠C Subt POE

m∠B = m∠E

∴ ∠B ≅ ∠E defn ∠ ≅

QED!

Theorem 4-1

If 2 $\angle$'s of 1 $\triangle$ are $\cong$ to 2 $\angle$'s of a 2nd $\triangle$

then the 3rd pair of $\angle$'s are $\cong$

L4.1 HW Problems

Pg 182, #1-27 odd,
30-35,
38-40,
44, 46, 47