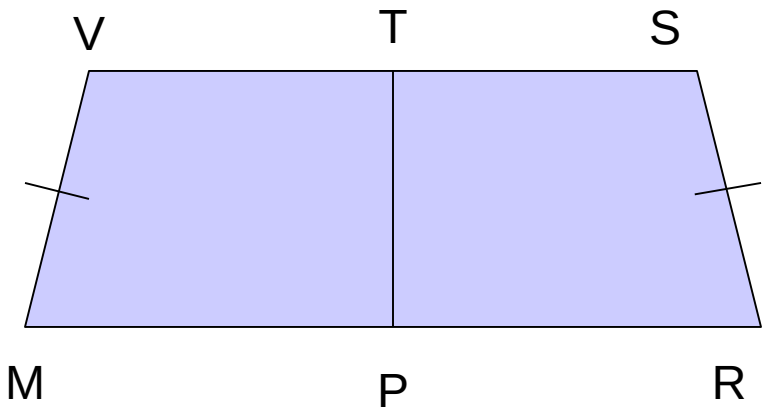
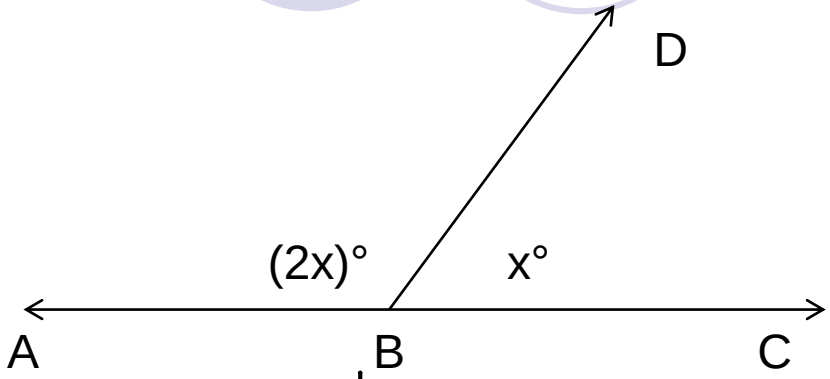
1. Grab board/marker for your group
2. Do WarmUp below

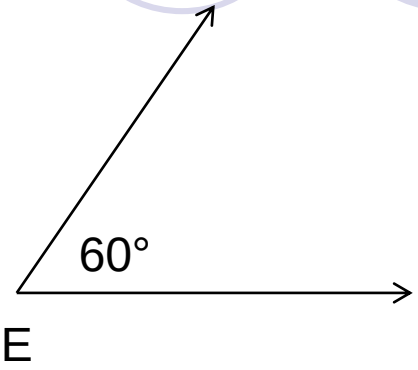
TP bisects VS and MR.
VM is congruent to SR.
MP = 9, VT = 6
Perimeter of MRSV = 62

Find VM.



Paragraph Proof





Observations

(•) ∠ABC = 180°

(•) 2x + x = 180

3x = 180

x = 60

• ∠E = 60°

• ∠DBC = 60° (b/c x = 60)

Given: *Diagram*

Prove: Angle DBC is congruent to Angle E

We are given a diagram where we assume ∠ABC is a straight ∠ measuring 180°

∠ABC = ∠ABD + ∠DBC, where ∠ABD = 2x and ∠DBC = x. Thus ∠ABC = 180 = 2x + x.

If 180 = 2x + x, then x = 60. If x = 60, then ∠DBC = 60° and ∠E = 60°. ∴ ∠DBC ≅ ∠E.

According to the diagram, Angle ABC is a straight angle.

Therefore,

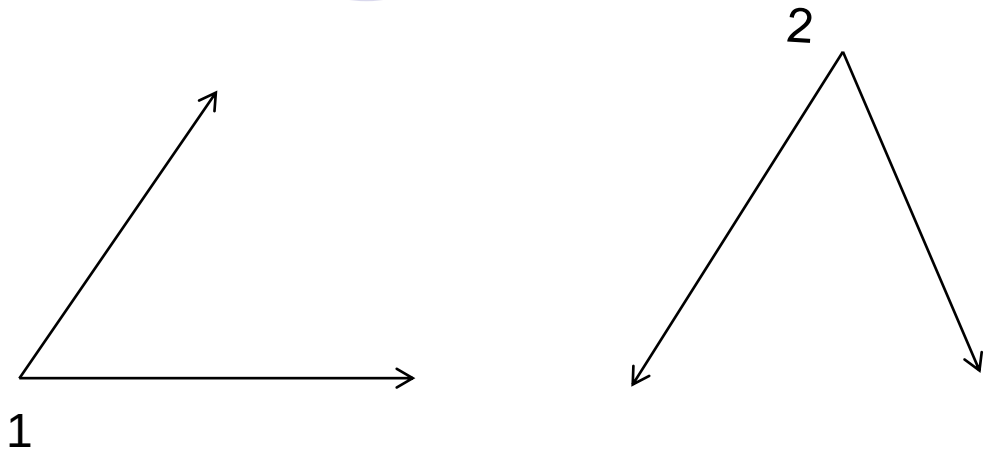
2x + x = 180

3x = 180

x = 60

Since BC = 60° and Angle E = 60°, the angles are congruent.

Paragraph Proof



Given: Angle 1 is acute
Angle 2 is acute
Conclusion: Angle 1 is congruent to Angle 2

This conclusion cannot be proved. For example, if mAngle 1 = 20 and mAngle 2 = 30, they are both acute but Angle 1 is not congruent to Angle 2. (*Counterexample)*

Paragraph Proof

D

E

Given: Angle D is 90°
Angle E is obtuse
Prove: Angle D is congruent to Angle E

This conclusion can be proved *false.* Since Angle E is obtuse, its measure is greater than 90. Since Angle D and Angle E have different measures, they are not congruent.

On Your Own:

- Do p.37 #2 and #3 in Boss-Secretary Format

Conditional Statements

I CAN…

- Write conditional, converse, and biconditional statements

Conditional Statements

- A conditional statement is written in the form ***if p, then q***.
- If a given condition is met (if p), then another condition is true or an event will happen (then q).
- The <u>if-clause is the hypothesis</u>;

  the *then-clause is the conclusion.*

Conditional Statements

Ex 1.) If you don't do your homework, then
p - Hypothesis

you will get lunch detention.
q - Conclusion

Rewrite the statements in if-then form:

Ex 2.) Every multiple of 4 is also a multiple of 2.

If a number is a multiple of 4, then it is a multiple of 2.

If a # is a mult. of 4 then it is also a mult. of 2

True or False?

True

Conditional Statements

- **Ex. 3)** $x^2 = 144, x = 12$

$$If\ x^2 = 144,\ then\ x = 12$$

True or False?

False – why?

Counterexample: $(-12)^2 = 144$

Logical Order

- When given several related conditional statements, you must put them in logical order. The conclusion of one statement will flow into the hypothesis of the next.

Logical Order – Put the following if-then statements in order

- A. If Cameron graduates with a degree, then he will make a lot of money.
- B. If Cameron studies hard, then his grades will be good.
- C. If Cameron makes a lot of money, then he will be able to buy a new car.
- D. If Cameron attends college, then he will graduate with a degree.
- E. If Cameron has good grades, then he will be able to attend college.

- Logical Order:
- B. If Cameron studies hard, then his grades will be good.
- E. If Cameron has good grades, then he will be able to attend college.
- D. If Cameron attends college, then he will graduate with a degree.
- A. If Cameron graduates with a degree, then he will make a lot of money.
- C. If Cameron makes a lot of money, then he will be able to buy a new car.

Logical Order Ex. 2 – Put the statements in logical order.

- A. If a shape is a square, then it is a rhombus.
- B. If a shape is a parallelogram , then it is a quadrilateral.
- C. If a shape is a quadrilateral, then it is a polygon.
- D. If a shape is a rhombus, then it is a parallelogram.

- A. If a shape is a square, then it is a rhombus.
- D. If a shape is a rhombus, then it is a parallelogram.
- B. If a shape is a parallelogram , then it is a quadrilateral.
- C. If a shape is a quadrilateral, then it is a polygon.

Inverse - Converse - Contrapositive

What is the Inverse?

- The inverse of a conditional statement is formed by negating the hypothesis and the conclusion.
- The sentence *if p, then q* becomes

  if not p, then not q.

- *State the inverse of the following conditional statements:*
- **Ex. 1)** If it is sunny today, then Julie will go running.

  Inverse – If it is not sunny today, then Julie will not go running

Converse

What is the converse?

- The converse of a conditional statement is formed by switching the places of the hypothesis and conclusion.
- The sentence *if p, then q* becomes

if q, then p.

Converse

State the converse of the if-then statements:

- **Ex. 1)** If a polygon has five sides, then it is a pentagon.
  p - hypothesis *q* - conclusion

  Converse – If a polygon is a pentagon, then it has five sides.
  q - conclusion *p* - hypothesis

True or False?

True

Converse

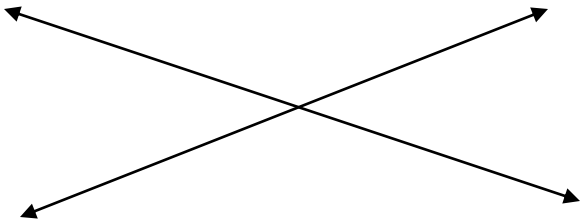
- **Ex. 2)** If two lines are perpendicular, then they intersect.

Converse – If two lines intersect, then they are perpendicular.

True or False?

False – Why?

Counterexample -



Converse

- **Ex. 3)** If a college football team wins the Big Ten Conference then they will play in a bowl game.

Converse – If a college football team plays in a bowl game then they won the Big Ten Conference.

True or False?

False – Why?

Counterexample - There are many other teams that play in bowl games!

Converse

- **Ex. 4)** If you get an A on the final exam then you will get an A in Advanced Geometry.

  Converse – If you get an A in Advanced Geometry then you got an A on the final exam.

  True or False?

  False – Why?

  Counterexample - The final exam is only 15% of your grade!

Converse

- **Ex. 5)** If three points are collinear then they lie on the same line.

  Converse – If three points lie on the same line then they are collinear.

  True or False?

  True!

Homework

- p. 37 #4 – 7, 9
- p. 42 #2 – 5, 8 – 12, 14