

What are the 5 purpose of proof?

1. VERIFY THE TRUTH OF A MATHEMATICAL STATEMENT.
2. EXPLAIN WHY THE STATEMENT IS TRUE
3. COMMUNICATE OUR MATH. KNOWLEDGE
4. DISCOVER NEW MATH
5. CREATE AXIOMATIC SYSTEM

What are the three postulates that prove triangles congruent?

LEVELS OF REASONING

- ① EXTERNAL
- ② EMPIRICAL
- ③ ANALYTIC

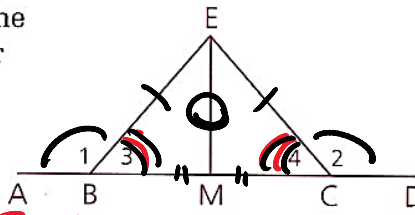


Sample Problems

20 Study the problem below, then copy the flow diagram and fill in the reason for each statement.

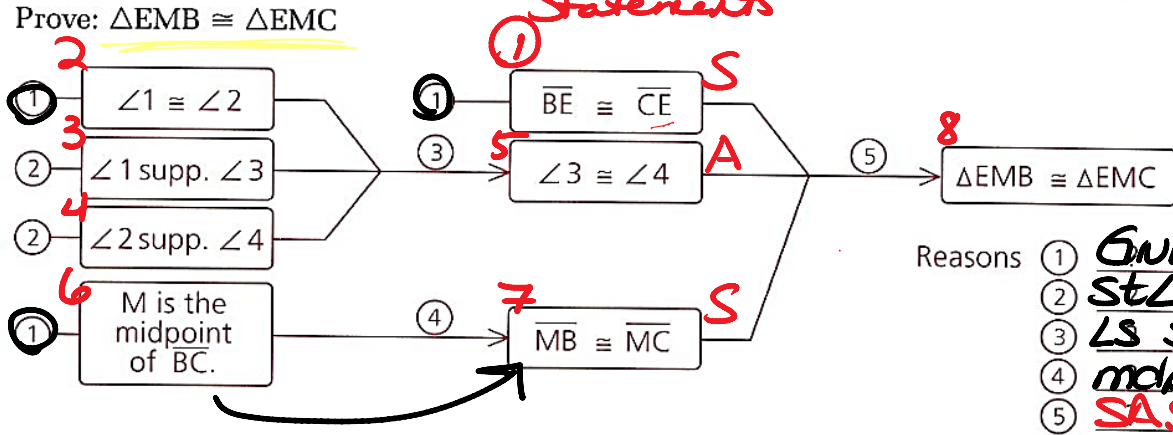
Given: $\angle 1 \cong \angle 2$;
M is the midpt. of \overline{BC} .
 $\overline{BE} \cong \overline{CE}$

Prove: $\triangle EMB \cong \triangle EMC$



SSS
~~SAS~~
ASA

MAP



- Reasons
- ① GIVEN
 - ② ~~STL~~ \rightarrow ~~supp~~ \angle S
 - ③ \angle S ~~supp~~ \cong \angle S \Rightarrow \cong \angle S
 - ④ midpt \Rightarrow \cong \overline{S} \cong \overline{S}
 - ⑤ SAS

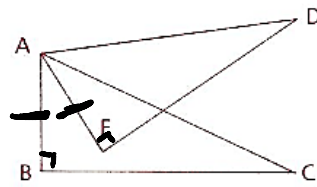
21 In problem 20, what given information is not needed to prove the triangles congruent?

$\angle 1 \cong \angle 2 \therefore \overline{EM} \cong \overline{EM}$ (Ref) then SSS.

Problem Set C

26 Given: $\overline{AB} \cong \overline{AE}$;
 \overline{AE} and \overline{AC} trisect $\angle BAD$.
 $\overline{AB} \perp \overline{BC}$,
 $\overline{AE} \perp \overline{DE}$

Conclusion: $\triangle ABC \cong \triangle AED$



Statements

1. $\overline{AB} \perp \overline{BC}$
 $\overline{AE} \perp \overline{DE}$

2. $\angle ABC \cong \angle AED$ 2. $\perp \Rightarrow \text{rt} \angle$

3. $\angle ABC \cong \angle AED$ 3. $\text{rt} \angle \Rightarrow \cong \angle$

4. $\overline{AB} \cong \overline{AE}$ 4. Given

5. \overline{AE} & \overline{AC} trisect $\angle BAD$ 5. Given

Reasons

1. Given

$AB = AE$

\overline{AE} & \overline{AC}
 trisect $\angle BAD$
 \downarrow

$AB \perp BC$
 $AE \perp DE$

\downarrow
 $\perp \Rightarrow \text{rt} \angle$
 $\text{rt} \angle \Rightarrow \cong \angle$

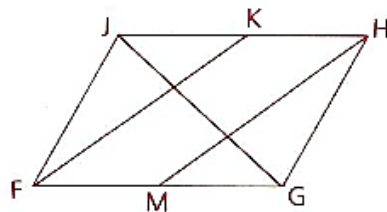
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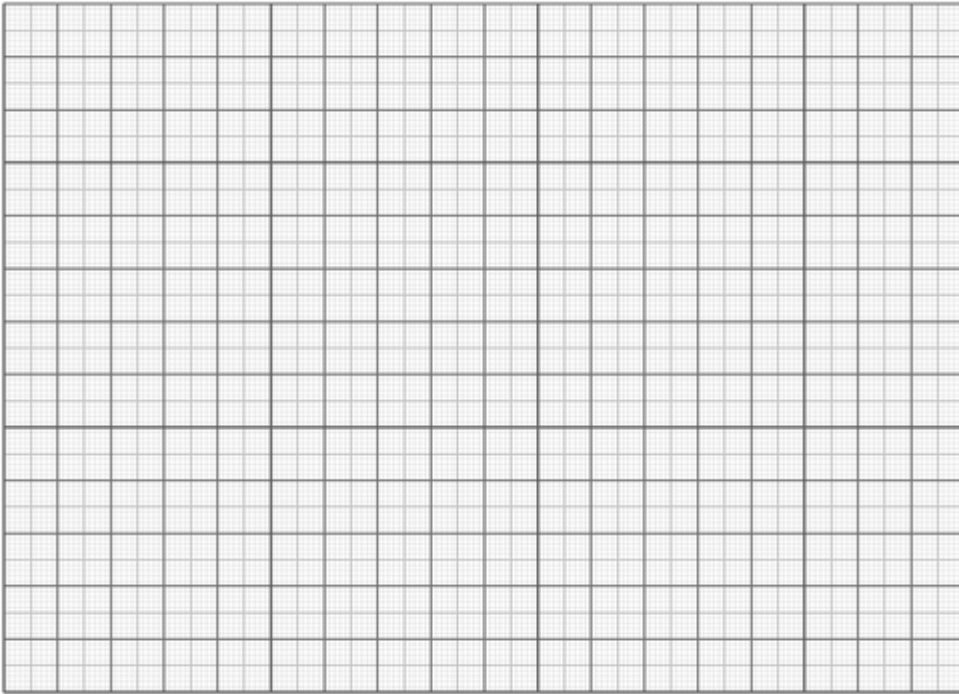
AMDG
3: Congruent Triangles
3.2

Ms. Kresovic
Date:

- 27 Given: $\overline{JH} \cong \overline{FG}$;
K and M are midpoints.
 $\angle HKF \cong \angle FMH$,
 $\angle KJG \cong \angle MGJ$,
 $\angle JGH \cong \angle FJG$
Conclusion: $\triangle FJK \cong \triangle HGM$



- 28** Consider two triangles, $\triangle ABC$ and $\triangle FDE$, with vertices $A = (0, 7)$, $B = (-4, 0)$, $C = (0, 0)$, $D = (2, 3)$, $E = (2, -1)$, and $F = (9, -1)$. Draw a diagram and explain why $\triangle ABC \cong \triangle FDE$.

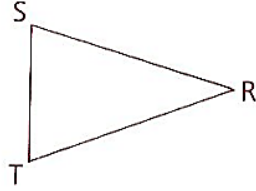


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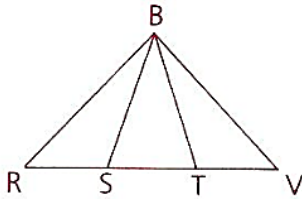
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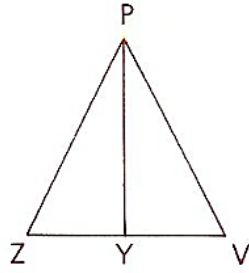
22 Given: $\overline{RS} \cong \overline{RT}$
Conclusion: $\triangle RST \cong \triangle RTS$



23 Given: S and T trisect \overline{RV}
 $\angle R \cong \angle V$
 $\angle BST \cong \angle BTS$
Conclusion: $\triangle BRS \cong \triangle BVT$



- 24 Given: \overrightarrow{PY} bisects $\angle VPZ$.
 $\angle VPY = (2x + 7)^\circ$,
 $\angle ZPY = (3x - 9)^\circ$,
 $PZ = \frac{1}{2}x + 5$,
 $PV = x - 3$
- Prove: $\triangle VPY \cong \triangle ZPY$
(Use a paragraph proof.)



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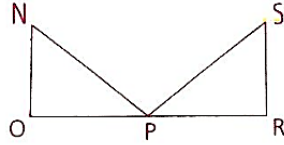
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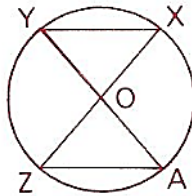
Homework

- 11 Given: $\angle N$ is comp. to $\angle NPO$.
 $\angle S$ is comp. to $\angle SPR$.
 $\angle NPO \cong \angle SPR$,
 $\overline{NP} \cong \overline{SP}$

Conclusion: $\triangle NOP \cong \triangle SRP$

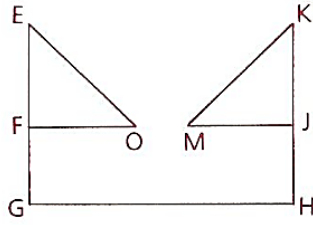


- 12 Given: O is the midpt. of \overline{AY} .
O is the midpt. of \overline{ZX} .
Conclusion: $\triangle ZOA \cong \triangle XOY$

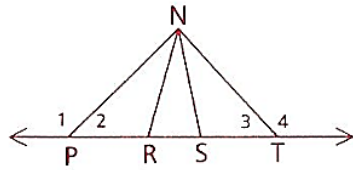


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- 13 Given: $\overline{EO} \cong \overline{KM}$,
 $\overline{FO} \cong \overline{JM}$,
 $\overline{EG} \cong \overline{KH}$;
F is the midpt. of \overline{EG} .
J is the midpt. of \overline{KH} .
Conclusion: $\triangle EFO \cong \triangle KJM$



- 14 Given: $\angle 1 \cong \angle 4$,
 $\overline{PR} \cong \overline{TS}$,
 $\overline{NP} \cong \overline{NT}$
Prove: $\triangle NPR \cong \triangle NTS$

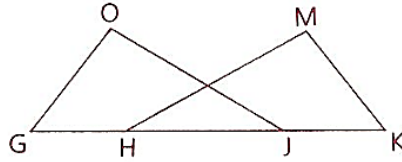


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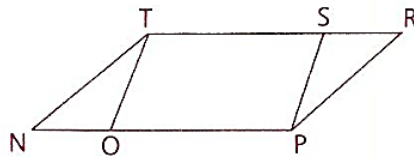
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- 15 Given: $\overline{GH} \cong \overline{KJ}$,
 $\overline{HM} \cong \overline{JO}$,
 $\overline{GO} \cong \overline{KM}$
Prove: $\triangle GOJ \cong \triangle KMH$



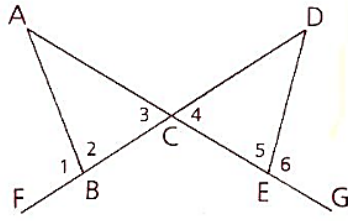
- 16 Given: $\angle R \cong \angle N$,
 $\overline{RP} \cong \overline{NT}$,
 $\overline{RT} \cong \overline{NP}$,
 $\overline{TS} \cong \overline{OP}$
Conclusion: $\triangle NOT \cong \triangle RSP$



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17 Given: $\angle 1 \cong \angle 6$,
 $\overline{BC} \cong \overline{EC}$

Conclusion: $\triangle ABC \cong \triangle DEC$

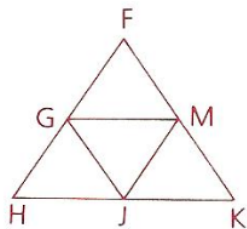


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- 18** Given: $\overline{FH} \cong \overline{FK}$,
 $\angle H \cong \angle K$;
G is the midpt. of \overline{FH} .
M is the midpt. of \overline{FK} .
J is the midpt. of \overline{HK} .
Conclusion: $\triangle GHJ \cong \triangle MKJ$



25 Given: $\angle 3 \cong \angle 1$, $\angle 4 \cong \angle 2$,
 $\angle DAC \cong \angle 3$, $\angle BAC \cong \angle 1$,
 $\overline{AD} \cong \overline{AB}$

Prove: $\triangle CAD \cong \triangle CAB$

