Name

Adv Geo -   3.2   Date:

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 MATHEMATICAL KNOWLEDGE
4. DISCOVER NEW MATH
5. CREATE AXIOMATIC SYSTEM

LEVELS OF REASONING: ① EXTERNAL Reasoning ② Empirical ③ Analytical
external motivation   observation   internal motivation

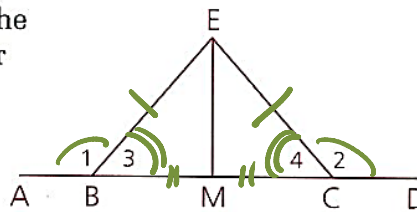What are the three postulates that prove triangles congruent?

SAS, SSS, & ASA

Sample Problems

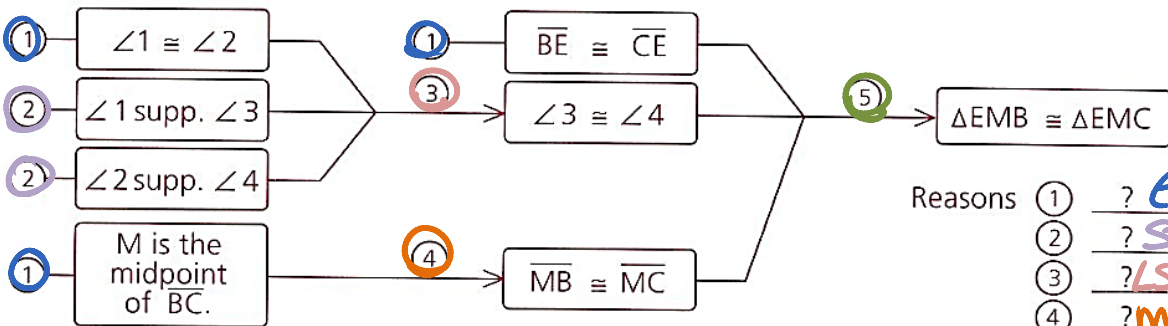**20** Study the problem below, then copy the flow diagram and fill in the reason for each statement.

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

① $\angle 1 \cong \angle 2$

② $\angle 1$ supp. $\angle 3$

② $\angle 2$ supp. $\angle 4$

① M is the midpoint of $\overline{BC}$.

① $\overline{BE} \cong \overline{CE}$

③ $\angle 3 \cong \angle 4$

④ $\overline{MB} \cong \overline{MC}$

⑤ $\triangle EMB \cong \triangle EMC$

BE ≅ CE

Reasons ① ? Given
② ? st ∠ ⇒ supp ∠s
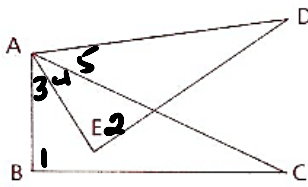③ ? ∠s supp ≅ ∠s ⇒ ≅ ∠s
④ ? mdpt ⇒ ≅ segs
⑤ ? SAS

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

$\angle 1 \cong \angle 2$ ∴ $\overline{EM} \cong \overline{EM}$ (ref) → SSS

Problem Set C

26 Given: $\overline{AB} \cong \overline{AE}$;

$\overrightarrow{AE}$ and $\overrightarrow{AC}$ trisect $\angle BAD$.

$\overline{AB} \perp \overline{BC}$,

$\overline{AE} \perp \overline{DE}$

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

$\overline{AB} \cong \overline{AE}$ $\quad$ $\overline{AB} \perp \overline{BC}$ $\quad$ $\overrightarrow{AE} + \overrightarrow{AC}$ tris

$\overline{AE} \perp \overline{DE}$

$\angle 1 \& \angle 2$ rt $\angle s$

$\angle 1 \cong \angle 2$

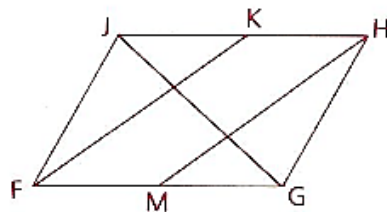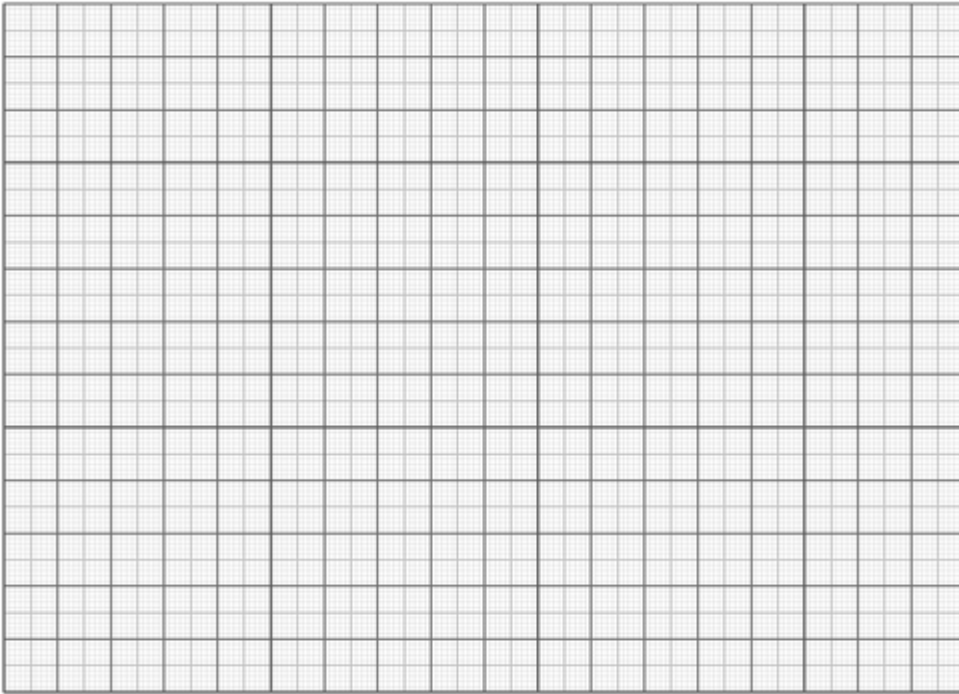|			
1	$\overrightarrow{AE} + \overrightarrow{AC}$ tris $\angle BAD$	1.	Given
A 2.	$\angle BAC \cong \angle EAD$	2.	Division
s 3.	$\overline{AB} \cong \overline{AE}$	3.	Given
4.	$\overline{AB} \perp \overline{BC}, \overline{AE} \perp \overline{DE}$	4.	Given
5.	$\angle ABC \& \angle AED$ rt $\angle$	5.	$\perp \Rightarrow$ rt $\angle$
A 6.	$\angle ABC \cong \angle AED$	6.	rt $\angle s \Rightarrow \cong \angle s$
7.	$\triangle ABC \cong \triangle AED$	7.	ASA (2 3 6)

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, △ABC and △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 △ABC ≅ △FDE.

Name   Ms. Kresovic
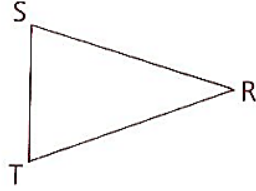
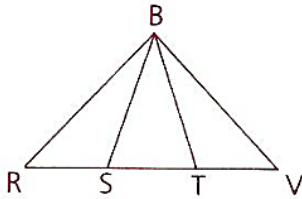Adv Geo -   Date:
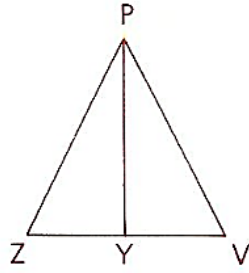
22 Given: $\overline{RS} \cong \overline{RT}$

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 $\angle VPZ$,

   $\angle VPY = (2x + 7)°,$

   $\angle ZPY = (3x - 9)°,$

   $PZ = \frac{1}{2}x + 5,$

   $PV = x - 3$

Prove: $\triangle VPY \cong \triangle ZPY$

   (Use a paragraph proof.)

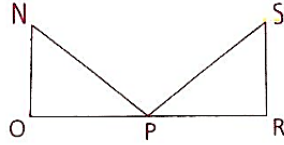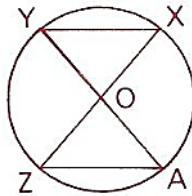Name   Ms. Kresovic
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Homework

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

  Conclusion: △NOP ≅ △SRP

12 Given: O is the midpt. of $\overline{AY}$.
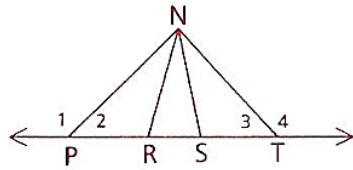   O is the midpt. of $\overline{ZX}$.

  Conclusion: △ZOA ≅ △XOY

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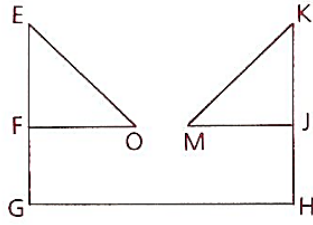
14 Given: $\angle 1 \cong \angle 4$,
  $\overline{PR} \cong \overline{TS}$,
  $\overline{NP} \cong \overline{NT}$
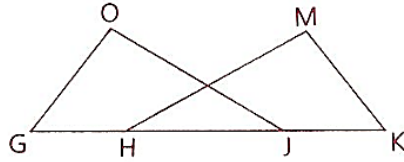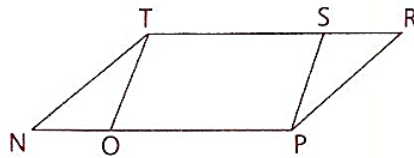Prove: $\triangle NPR \cong \triangle NTS$

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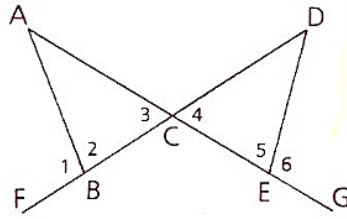
     Prove: $\triangle GOJ \cong \triangle KMH$

16 Given: $\angle R \cong \angle N$,
           $\overline{RP} \cong \overline{NT}$,
           $\overline{RT} \cong \overline{NP}$,
           $\overline{TS} \cong \overline{OP}$

     Conclusion: $\triangle NOT \cong \triangle RSP$

17 Given: ∠1 ≅ ∠6,
$\overline{BC}$ ≅ $\overline{EC}$

Conclusion: △ABC ≅ △DEC

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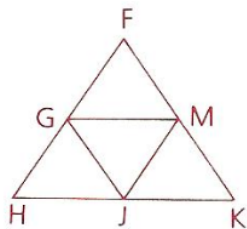
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18 Given: $\overline{FH} \cong \overline{FK}$,

  $\angle H \cong \angle K$;

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

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