

Review - Chapter 4 Test

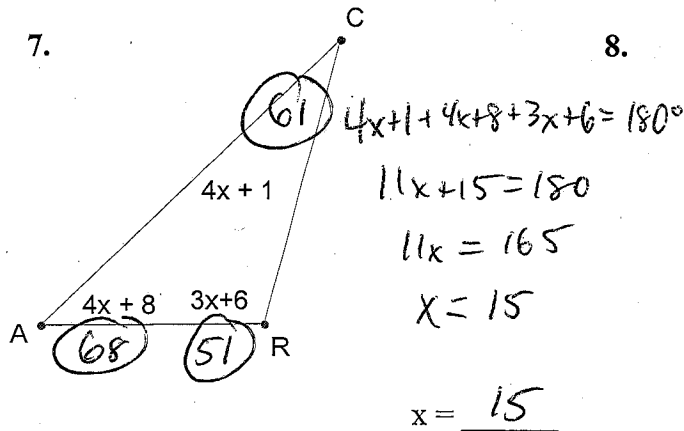
Name Wey hr

Classifying Triangles. Define the following terms.

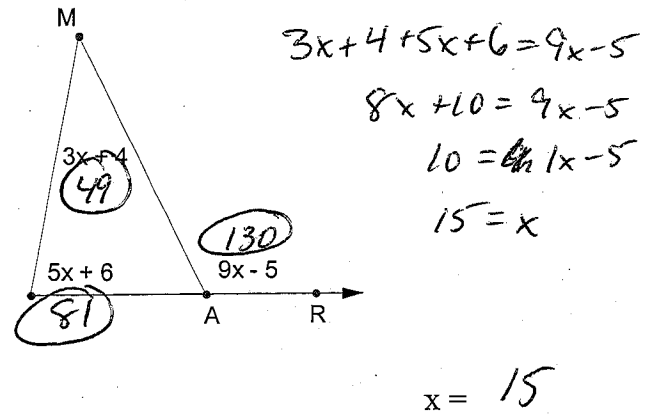
1. Isosceles Δ w/ at least 2 \cong sides
2. Right Δ w/ 1 right angle
3. Obtuse Δ w/ 1 angle larger than 90° .
4. Scalene Δ w/ no \cong sides.
5. Acute Δ w/ 3 angles less than 90° .
6. Equilateral Δ w/ 3 \cong sides.

Solve for the missing variable.

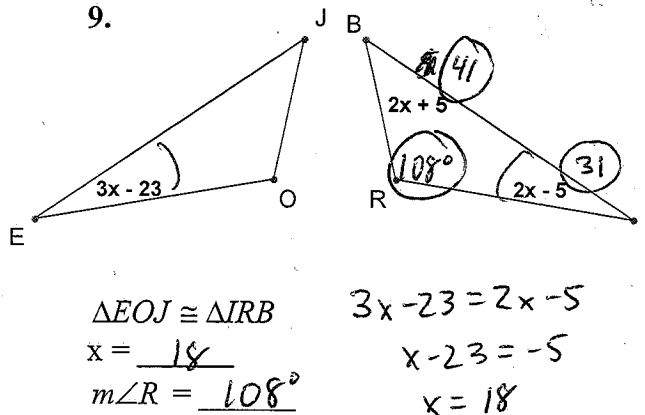
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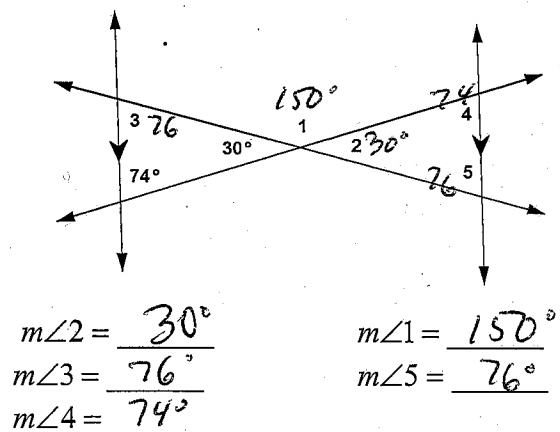
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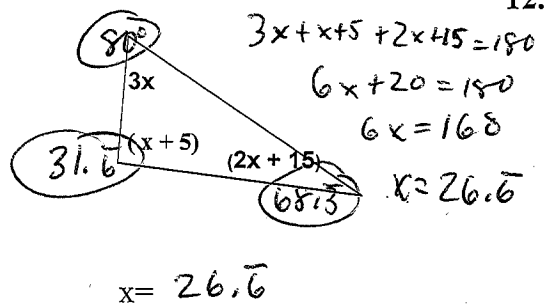
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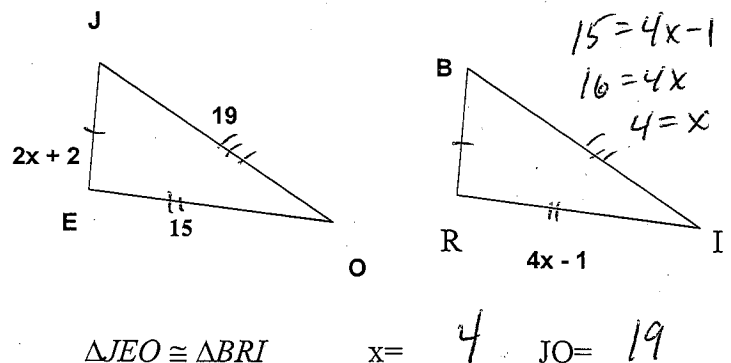
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11.



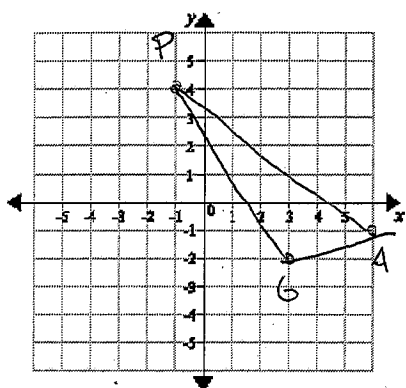
12.



13. Determine if $\triangle GAP$ is isosceles, equilateral, or scalene. The triangle has the following coordinates:

G (3, -2) A (6, -1) P (-1, 4)

a) Sketch the triangle.



b) Find the distance of each side. $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$$\begin{aligned} GA &= \sqrt{(6-3)^2 + (-1-(-2))^2} \\ &= \sqrt{(3)^2 + (1)^2} \\ &= \sqrt{9+1} \\ &= \sqrt{10} \\ &= 3.2 \end{aligned}$$

$$\begin{aligned} AP &= \sqrt{(-1-6)^2 + (4-(-1))^2} \\ &= \sqrt{(-7)^2 + (5)^2} \\ &= \sqrt{49+25} \\ &= \sqrt{74} \\ &= 8.6 \end{aligned}$$

$$GA = 3.2$$

$$AP = 8.6$$

$$PG = 7.2$$

$$PG = \sqrt{(3-(-1))^2 + (-2-4)^2}$$

$$\begin{aligned} &= \sqrt{(3+1)^2 + (-2-4)^2} \\ &= \sqrt{(4)^2 + (-6)^2} \\ &= \sqrt{16+36} \\ &= \sqrt{52} = 7.2 \end{aligned}$$

c) Classify the triangle by its sides. scalene

The variable expressions represent the angle measures of a triangle. Find the measure of each angle. Then classify the triangle by its angles.

14. $m\angle A = x^\circ$ 30°
 $m\angle B = 2x^\circ$ 60°
 $m\angle C = 3x^\circ$ 90°

$$\begin{aligned} x + 2x + 3x &= 180 \\ 6x &= 180 \\ x &= 30 \end{aligned}$$

right \triangle

15. $m\angle A = (3x - 17)^\circ$ 64°
 $m\angle B = (x + 40)^\circ$ 67°
 $m\angle C = (2x - 5)^\circ$ 49°

$$\begin{aligned} 3x - 17 + x + 40 + 2x - 5 &= 180 \\ 6x + 18 &= 180 \\ 6x &= 162 \\ x &= 27 \end{aligned}$$

acute \triangle

16. $m\angle A = 2x^\circ$ 100°
 $m\angle B = x^\circ$ 50°
 $m\angle C = (x - 20)^\circ$ 30°

$$\begin{aligned} 2x + x + x - 20 &= 180 \\ 4x - 20 &= 180 \\ 4x &= 200 \\ x &= 50 \end{aligned}$$

obtuse \triangle

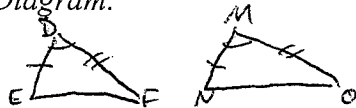
For each question below:

a) Draw and mark a diagram using the given information.

b) State the third congruence that must be used to prove $\triangle DEF \cong \triangle MNO$ using the indicated postulate or theorem.

17. $\overline{DE} \cong \overline{MN}$ and $\angle M \cong \angle D$ by SAS

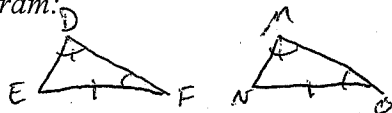
Diagram:



Third Congruence: $\overline{DF} \cong \overline{MO}$

18. $\overline{FE} \cong \overline{ON}$ and $\angle F \cong \angle O$ by AAS

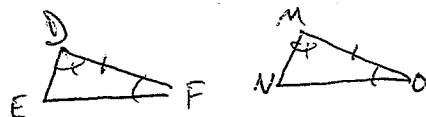
Diagram:



Third Congruence: $\angle D \cong \angle M$

19. $\overline{DF} \cong \overline{MO}$ and $\angle F \cong \angle O$ by ASA

Diagram:

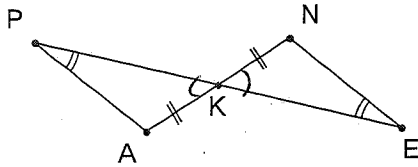


Third Congruence: $\angle D \cong \angle M$

For each question below:

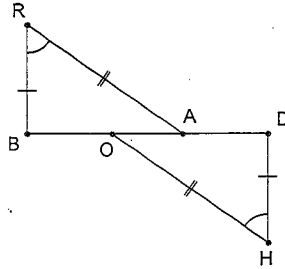
- a) State which triangle congruence method, if any, can be used to prove the triangles are congruent. If none, write *none*.
 b) IF the triangles are congruent, complete the congruence statement.

20.



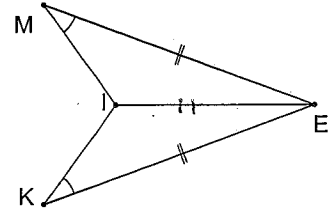
$\triangle PKA \cong \triangle ENK$ by AAS

21.



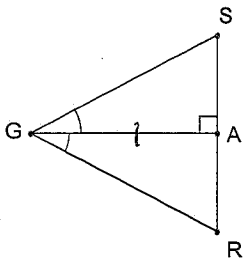
$\triangle RAB \cong \triangle HDK$ by SAS

22.



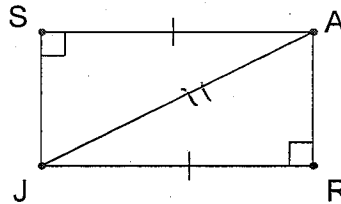
$\triangle MIE \cong$ None by

23.



$\triangle GSA \cong \triangle GSA$ by ASA

24.

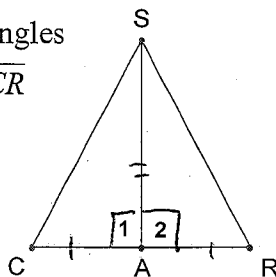


$\triangle SJA \cong \triangle RJA$ by HL

Complete the proofs.

25. **Given:** $\angle 1$ and $\angle 2$ are rt angles
 A is the midpt of \overline{CR}

Prove: $\triangle CSA \cong \triangle RSA$

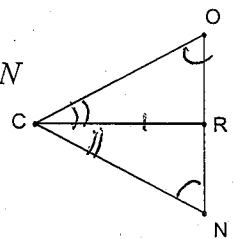


- ① $\angle 1$ and $\angle 2$ are rt \angle 's
- ② A is midpt of \overline{CR}
- ③ $m\angle 1 = 90^\circ$
- ④ $m\angle 2 = 90^\circ$
- ⑤ $m\angle 1 = m\angle 2$
- A ⑥ $\angle 1 \cong \angle 2$
- S ⑦ $\overline{CA} \cong \overline{AR}$
- S ⑧ $\overline{AS} \cong \overline{AS}$
- ⑨ $\triangle CSA \cong \triangle RSA$

- ① Given
- ② Given
- ③ Defn of right \angle
- ④ Defn of right \angle
- ⑤ Substitution (4 \rightarrow 3)
- ⑥ Defn. of congruence
- ⑦ Defn of midpt
- ⑧ Reflexive
- ⑨ SAS

26. **Given:** $\angle O \cong \angle N$
 \overline{CR} bisects $\angle OCN$

Prove: $\triangle COR \cong \triangle CNR$

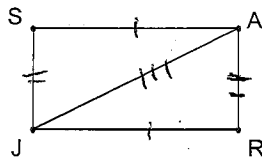


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|---|-----------------------------|
| A ① $\angle O \cong \angle N$ | ① Given |
| ② \overline{CR} bisects $\angle OCN$ | ② Given |
| A ③ $\angle OCR \cong \angle NCR$ | ③ Defn of \angle bisector |
| S ④ $\overline{CR} \cong \overline{CR}$ | ④ Reflexive |
| ⑤ $\triangle COR \cong \triangle CNR$ | ⑤ AAS |

Complete the proofs.

27. Given: $\overline{AS} \cong \overline{JR}$
 $\overline{SJ} \cong \overline{RA}$

Prove: $\triangle AJS \cong \triangle JAR$

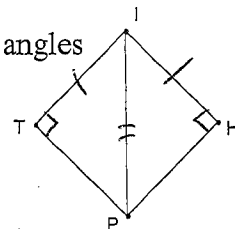


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|---|-------------|
| S ① $\overline{AS} \cong \overline{JR}$ | ① Given |
| S ② $\overline{SJ} \cong \overline{RA}$ | ② Given |
| S ③ $\overline{JA} \cong \overline{JA}$ | ③ Reflexive |
| ④ $\triangle AJS \cong \triangle JAR$ | ④ SSS |

28. Given: $\overline{IH} \cong \overline{IT}$

$\angle T$ and $\angle H$ are rt. angles

Prove: $\triangle TIP \cong \triangle HIP$

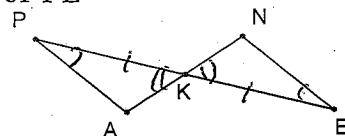


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|--|-----------------------|
| S ① $\overline{IH} \cong \overline{IT}$ | ① Given |
| ② $\angle T$ and $\angle H$ are rt. angles | ② Given |
| ③ $m\angle T = 90^\circ$ | ③ Defn of rt. angle |
| ④ $m\angle H = 90^\circ$ | ④ Defn of right angle |
| ⑤ $m\angle T = m\angle H$ | ⑤ Subst (4-3) |
| A ⑥ $\angle T \cong \angle H$ | ⑥ Defn of \cong |
| S ⑦ $\overline{IP} \cong \overline{IP}$ | ⑦ Reflexive |
| ⑧ $\triangle TIP \cong \triangle HIP$ | ⑧ HL |

29. Given: $\angle P \cong \angle E$

K is the midpoint of \overline{PE}

Prove: $\triangle PKA \cong \triangle EKN$

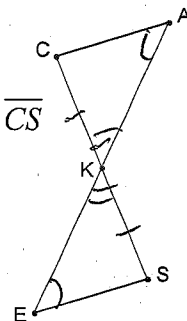


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|---|-------------------|
| A ① $\angle P \cong \angle E$ | ① Given |
| ② K is midpt of \overline{PE} | ② Given |
| S ③ $\overline{PK} \cong \overline{KE}$ | ③ Defn of midpt |
| A ④ $\angle PKA \cong \angle EKN$ | ④ Vertical Angles |
| ⑤ $\triangle PKA \cong \triangle EKN$ | ⑤ ASA |

30. Given: $\angle A \cong \angle E$

K is the midpoint of \overline{CS}

Prove: $\triangle CKA \cong \triangle SKE$



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|---|-----------------|
| A ① $\angle A \cong \angle E$ | ① Given |
| ② K is midpt of \overline{CS} | ② Given |
| S ③ $\overline{CK} \cong \overline{KS}$ | ③ Defn of midpt |
| ④ $\angle CKA \cong \angle SKE$ | ④ Vert Angles |
| ⑤ $\triangle CKA \cong \triangle SKE$ | ⑤ AAS |