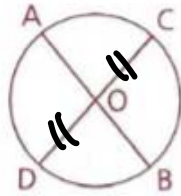




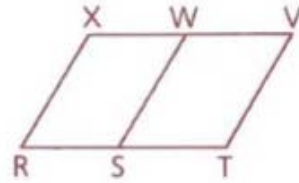
1 Name the congruent segments.

a O is the midpoint of \overline{CD} .



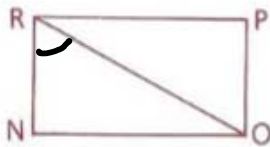
10/12
21/12

b \overline{SW} bisects \overline{XV} . $\overline{XW} \cong \overline{VW}$



2 Name the congruent angles.

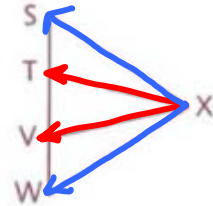
a \overrightarrow{RO} bisects $\angle NRP$.



$\angle NRO \cong \angle PRO$

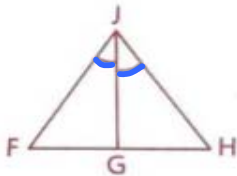
b \overrightarrow{XT} and \overrightarrow{XV} trisect $\angle SXW$.

$\angle WXV \cong$
 $\angle VXT \cong$
 $\angle TXS$



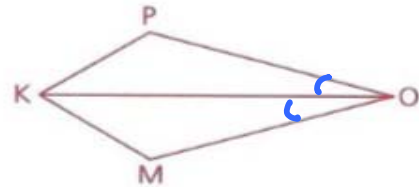
3 Name the angle bisector.

a



\overrightarrow{JG}

b $m\angle POK = m\angle MOK$



\overline{OK}



4 Find $\angle XTZ$ if \overrightarrow{TZ} bisects $\angle XTY$ and $\angle XTY$ equals

a 60°

30°

b $48^\circ 50'$

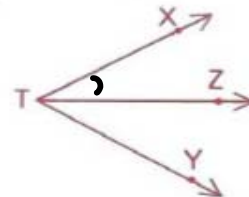
$24^\circ 25'$

c $36\frac{1}{2}^\circ$

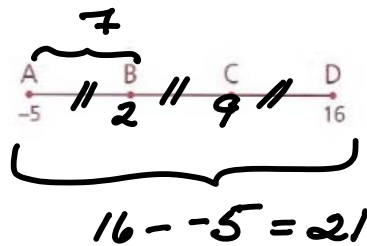
$18\frac{1}{4}^\circ$

d $85^\circ 74'$

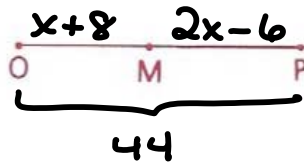
$+1-60$
 $86^\circ 14' \rightarrow 43^\circ 07'$



- 5 B and C trisect \overline{AD} .
 a Find the coordinates of B and C. **2 & 9**
 b Find $AC = 14$



- 6 Given: $OM = x + 8$,
 $MP = 2x - 6$,
 $OP = 44$



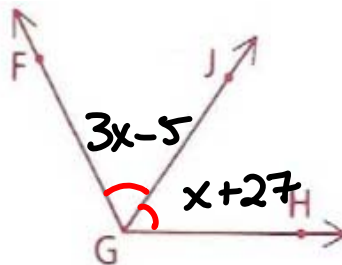
Is M the midpoint of \overline{OP} ?

$$\begin{aligned} x+8+2x-6 &= 44 \\ 3x+2 &= 44 \\ 3x &= 42 \\ x &= 14 \end{aligned}$$

$$\begin{aligned} OM &= 14+8 = 22 \\ MP &= 2(14)-6 = 22 \\ \text{Yes, M mdpt } \overline{OP}. \end{aligned}$$

- 7 Given: $m\angle FGJ = 3x - 5$,
 $m\angle JGH = x + 27$;
 \overrightarrow{GJ} bisects $\angle FGH$.

Find: $m\angle FGJ$



$$\begin{aligned} 3x-5 &= x+27 \\ -x+5 & \quad -x+5 \\ 2x &= 32 \end{aligned}$$

$$\begin{aligned} x &= 16 \\ m\angle FGJ &= 3(10+6)-5 \\ &= \underline{30+18-5} = \boxed{43^\circ} \end{aligned}$$



8 B and C are trisection points of \overline{AD} , and $AD = 12$.

a Find AB.

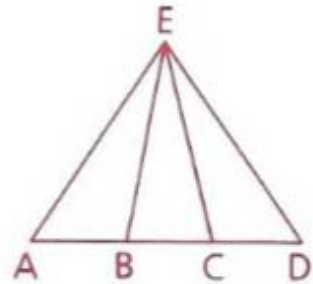
b Find AC.

c If $AB = x + 3$, solve for x .

d If $AB = x + 3$ and $AE = 3x + 6$, find AE.

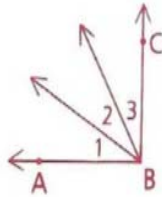
e What segment is C the midpoint of?

f Do \overrightarrow{EB} and \overrightarrow{EC} trisect $\angle AED$?



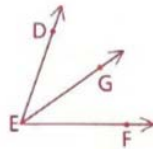
- 9 Given: $\angle ABC = 90^\circ$,
 $\angle 1 = (2x + 10)^\circ$,
 $\angle 2 = (x + 20)^\circ$,
 $\angle 3 = (3x)^\circ$

Has $\angle ABC$ been trisected?



In problems 10 and 11, reason 2 in each proof is stated incorrectly. Supply the correct final reason for each problem.

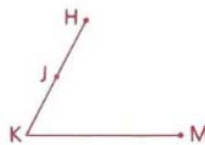
- 10 Given: $\angle DEG \cong \angle FEG$
 Prove: \vec{EG} bisects $\angle DEF$.



Statements	Reasons
1 $\angle DEG \cong \angle FEG$	1 Given
2 \vec{EG} bisects $\angle DEF$.	2 If a ray divides an angle into two angles, the ray bisects the angle. \cong (What is the correct reason?)

$2 \cong \angle s \Rightarrow \text{ray bis } \angle$

- 11 Given: $\overline{KJ} \cong \overline{HJ}$
 Prove: J is the midpoint of \overline{HK} .



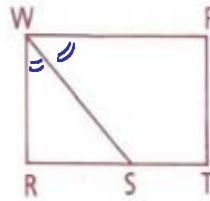
Statements	Reasons
1 $\overline{KJ} \cong \overline{HJ}$	1 Given
2 J is the midpoint of \overline{HK} .	2 If a point is the midpoint of a segment, it divides the segment into two congruent segments. (What is the correct reason?)

$2 \cong \text{ segs} \Rightarrow \text{mdpt}$

converse

In problems 12-17, write a proof in two-column form.

12 Given: \vec{WS} bisects $\angle RWP$.
 Prove: $\angle RWS \cong \angle PWS$



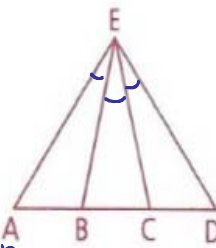
Statements	Reasons
1. \vec{WS} bisects $\angle RWP$.	1. Given
2. $\angle RWS \cong \angle PWS$	2. \rightarrow bis $\angle \Rightarrow 2 \cong \angle s$

13 Given: $\overline{XY} \cong \overline{YZ}$
 Prove: Y is the midpoint of \overline{XZ} .



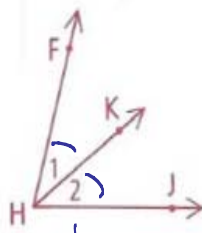
Statements	Reasons
1. $\overline{XY} \cong \overline{YZ}$	1. Given
2. Y mdpt \overline{XZ}	2. $2 \cong$ seg \Rightarrow mdpt

14 Given: $\angle AEB \cong \angle BEC \cong \angle CED$
 Conclusion: \vec{EB} and \vec{EC} trisect $\angle AED$.



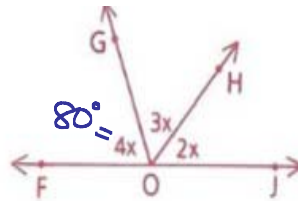
Statements	Reasons
1. $\angle AEB \cong \angle BEC \cong \angle CED$	1. Given
2. \vec{EB} & \vec{EC} trisect $\angle AED$	2. $3 \cong \angle s \Rightarrow$ trisection

15 Given: $\angle 1 \cong \angle 2$
 Conclusion: \vec{HK} bisects $\angle FHJ$.



Statements	Reasons
1. $\angle 1 \cong \angle 2$	1. Given
2. \vec{HK} bis $\angle FHJ$	2. $2 \cong \angle s \Rightarrow$ \rightarrow bis \angle

- 18 \vec{OG} and \vec{OH} divide straight angle FOJ into three angles whose measures are in the ratio 4:3:2. Find $m\angle FOG$.



$$4x + 3x + 2x = 180$$

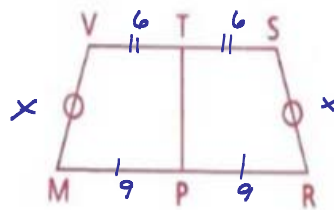
$$9x = 180$$

$$x = 20$$



- 19 Given: \vec{TP} bisects \overline{VS} and \overline{MR} .
 $\overline{VM} \cong \overline{SR}$,
 $MP = 9$, $VT = 6$,
perimeter of MRSV = 62

Find: $VM = 16$



$$2x + 30 = 62$$

$$2x = 32$$

$$x = 16$$



- 21 a Find the value of x . = 2

- b Is Q the midpoint of \overline{PR} ?

$7 \neq 8 \therefore$ No

$$x^2 + 3 + 4 + 2x = 15$$

$$x^2 + 2x + 7 = 15$$

$$x^2 + 2x - 8 = 0$$

$$(x+4)(x-2) = 0$$

$$x = -4 \text{ or } x = 2$$

If $x = -4$
then $QR = 4 - 8$
doesn't work.

If $x = 2$
 $PQ = 7$
 $QR = 8$

