

1 - REVIEW

Using a property from algebra, justify the following statements.

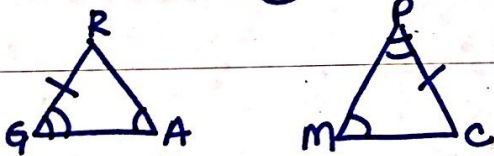
1.  $LM = LM$  reflexive
2. If  $m < A = m < B$  and  $m < B = m < C$ , then  $m < A = m < C$ . transitive
3.  $2(x + 5) = 2x + 10$  distributive
4. If  $x = 10$  and  $3x = y$ , then  $30 = y$ . substitution
5. If  $x = 9$ , then  $9 = x$ . symmetric
6. If  $8x = 80$ , then  $x = 10$ . division
7. If  $x = y$ , then  $x - 3 = y - 3$ . subtraction
8.  $\angle CAT \cong \angle TAC$  reflexive
9. If  $x = 10$ , then  $x + 5 = 10 + 5$  addition
10. If  $6x = 8$ , then  $12x = 16$  multiplication

11. Given:  $\triangle GEO \cong \triangle MTR$ . You can conclude that:

- a.  $\angle O \cong \angle T$      b.  $\overline{EG} \cong \overline{TM}$     c.  $\angle OGE \cong \angle MRT$      d.  $\overline{RM} \cong \overline{OG}$      e.  $\overline{GE} \cong \overline{MT}$

12. Given:  $\triangle RGA$  and  $\triangle PMC$  with  $\overline{RG} \cong \overline{PC}$ ,  $\angle A \cong \angle M$ , and  $\angle G \cong \angle P$ . Which method could be used to prove that  $\triangle RGA \cong \triangle PMC$ ?

- b. SSS     c. AAS    d. ASA    e. Not enough information for a proof.



13. The measures of the angles of a triangle are  $2x + 10$ ,  $3x$  and  $8x - 25$ . Solve for  $x$ .

$$2x + 10 + 3x + 8x - 25 = 180$$

$$13x - 15 = 180$$

$$13x = 195$$

$x = 15$

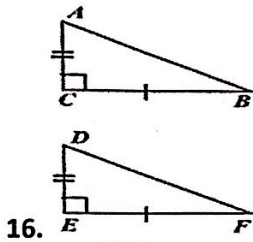
14. If  $\triangle TAR \cong \triangle DEW$ , the  $\angle A \cong \underline{\angle E}$ ,  $\overline{RT} \cong \underline{\overline{WD}}$ , and  $\triangle ART \cong \underline{\triangle EWD}$ .

15. Give the image points of the line segment  $\triangle ABC$ , which of the following would result in similar figures?

A(-3, 7) B(4, 2) C(0, 5)

- a.  $A'(-3, -7)$   $B'(4, -2)$   $C'(0, -5)$   
 b.  $A'(7, -3)$   $B'(2, 4)$   $C'(5, 0)$   
 c.  $A'(-1, 6)$   $B'(6, 1)$   $C'(2, 4)$   
 d.  $A'(-6, 14)$   $B'(8, 4)$   $C'(0, 10)$

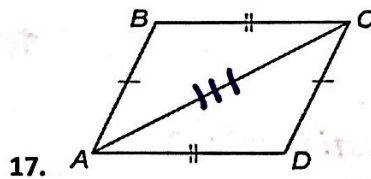
For problems 16 – 21: Determine if the triangles are congruent. MARK your diagrams! If so, write a congruency statement AND state the method of proving them congruent. If not, write "no congruence".



16.

SAS

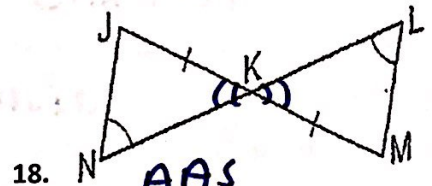
$$\triangle ACB \cong \triangle DEF$$



17.

SSS

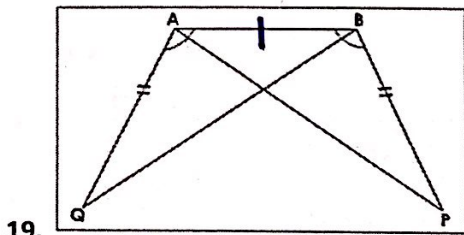
$$\triangle ABC \cong \triangle CDA$$



18.

AAS

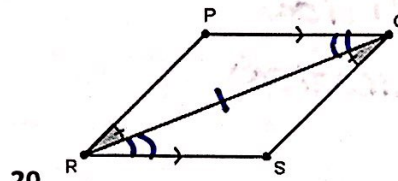
$$\triangle NKJ \cong \triangle LKM$$



19.

SAS

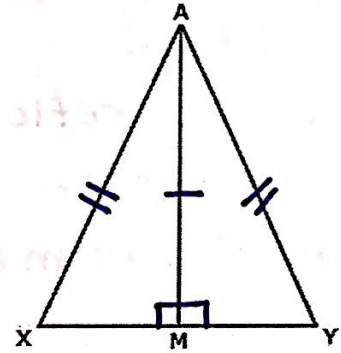
$$\triangle QAB \cong \triangle PBA$$



20.

ASA

$$\triangle RPQ \cong \triangle QSR$$



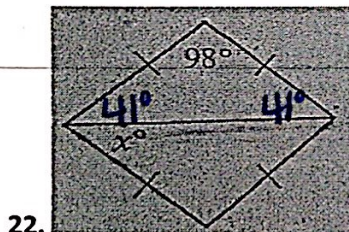
21.

Given:  $AM \perp XY, AX=AY$

HL

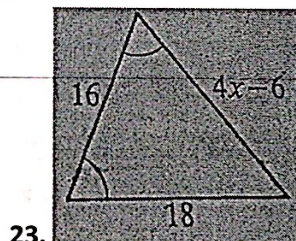
$$\triangle XMA \cong \triangle YMA$$

For problems 22-24, find the value of x or y.



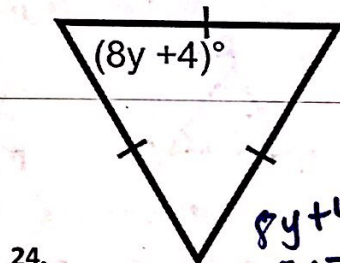
22.

$$x = 41^\circ$$



23.

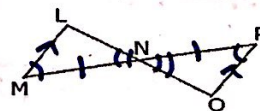
$$\begin{aligned} 4x - 6 &= 18 \\ 4x &= 24 \\ x &= 6 \end{aligned}$$



24.

$$\begin{aligned} 8y + 4 &= 60 \\ 8y &= 56 \\ y &= 7 \end{aligned}$$

25. Given: N is the midpoint of  $\overline{MP}$ ,  $\overline{LM} \parallel \overline{OP}$   
Prove:  $\triangle LNM \cong \triangle ONP$



statements

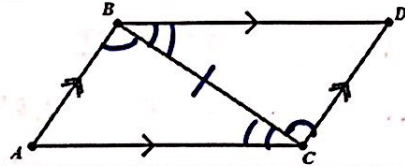
Reasons

- ① N is mp of mp
- ②  $\overline{MN} \cong \overline{PN}$
- ③  $\overline{LM} \parallel \overline{OP}$
- ④  $\angle M \cong \angle P$
- ⑤  $\angle LNM \cong \angle ONP$
- ⑥  $\triangle LNM \cong \triangle ONP$

- ① Given
- ② def of midpt.
- ③ Given
- ④ if  $\parallel$ , alt int  $\angle \cong$
- ⑤ vertical angle  $\cong$
- ⑥ ASA



26. Given:  $\overline{AB} \parallel \overline{CD}, \overline{AC} \parallel \overline{BD}$   
 Prove:  $\overline{AB} \cong \overline{CD}$



- S
- ①  $\overline{AB} \parallel \overline{CD}, \overline{AC} \parallel \overline{BD}$
  - ②  $\angle ABC \cong \angle DCB$
  - ③  $\angle DBC \cong \angle ACB$
  - ④  $\overline{BC} \cong \overline{BC}$
  - ⑤  $\triangle ABC \cong \triangle DCB$
  - ⑥  $\overline{AB} \cong \overline{CD}$

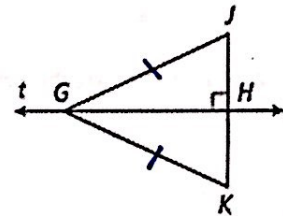
- P
- ① Given
  - ②  $\parallel$ , alt int  $\angle$ 's  $\cong$
  - ③  $\parallel$ , alt int  $\angle$ 's  $\cong$
  - ④ Reflexive
  - ⑤ ASA
  - ⑥ CPCTC

27. Given that line  $t$  is the perpendicular bisector of  $\overline{JK}$  and  $GK = 9.73$ , find  $GJ = 9.73$

28. Given that line  $t$  is the perpendicular bisector of  $\overline{JK}$ ,  $JG = 2x + 7$  and  $KG = 5x - 17$ , find  $KG$

$$\begin{aligned} 2x + 7 &= 5x - 17 \\ 24 &= 3x \\ x &= 8 \end{aligned}$$

$$\boxed{KG = 23}$$



29. Given that  $GJ = 70.2$ ,  $HK = 17.5$ , and  $GK = 70.2$ , find  $\overline{JK} = 35$

30. Given that line  $t$  is the perpendicular bisector of  $\overline{JK}$ , if  $JH = 2x - 1$ ,  $GJ = 4x - 2$  and  $GK = 2x + 10$ , find  $\overline{JH}$

$$\begin{aligned} GJ &= GK \\ 4x - 2 &= 2x + 10 \\ 2x &= 12 \\ x &= 6 \end{aligned}$$

$$\overline{JH} = 2(6) - 1$$

$$\boxed{\overline{JH} = 11}$$

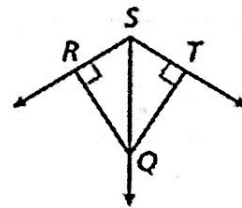
31. Given that  $m\angle RSQ = m\angle TSQ$  and  $TQ = 1.3$ , find  $\overline{QR} = 1.3$

32. Given that  $m\angle RSQ = 58^\circ$ ,  $RQ = 49$  and  $TQ = 49$ , find  $m\angle RST = 116^\circ$

33. Given that  $RQ = TQ$ ,  $m\angle QSR = (2a + 48)^\circ$  and  $m\angle QST = (6a + 40)^\circ$ , find  $m\angle RST$

$$\begin{aligned} 2a + 48 &= 6a + 40 \\ 8 &= 4a \\ a &= 2 \end{aligned}$$

$$\boxed{m\angle RST = 104^\circ}$$



$HI + HG$  are midsegments

34.  $HI = ?$  9.1

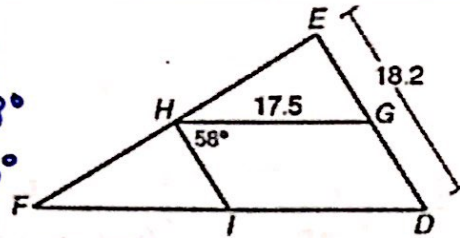
37)  $DF = ?$  35

35.  $GE = ?$  9.1

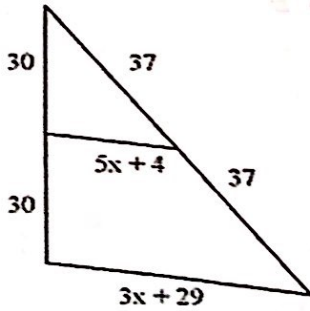
38)  $m\angle HIF = ?$   $58^\circ$

36.  $m\angle HGD = ?$   $122^\circ$

39)  $m\angle D = ?$   $50^\circ$



40) Solve for x



$$2(5x + 4) = 3x + 29$$

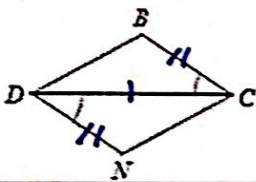
$$10x + 8 = 3x + 29$$

$$7x = 21$$

$$x = 3$$

State what additional information is required in order to know that the triangles are congruent for the reason given.

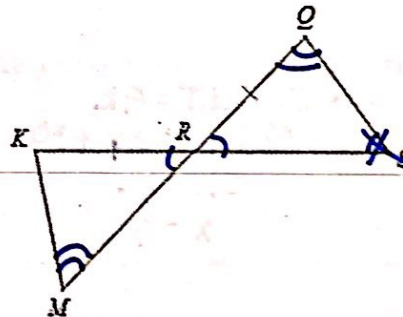
41) SAS



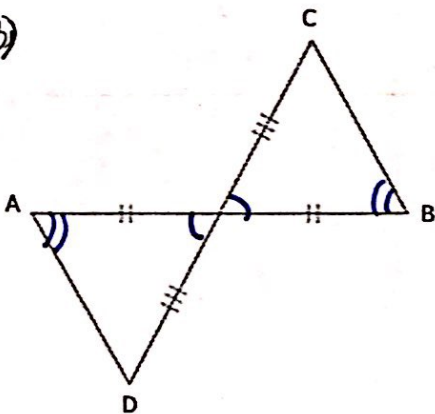
$$\overline{BC} \cong \overline{ND}$$

42) AAS

$$\angle Q \cong \angle M$$



43)



If  $m\angle A = 2x + 4$ ,  $m\angle B = 7x - 1$  and  $m\angle C = 2x + 9$ , find measure of angles A, B, C, and D

$$m\angle A = m\angle B$$

$$m\angle A = 6^\circ$$

$$2x + 4 = 7x - 1$$

$$m\angle B = 6^\circ$$

$$5 = 5x$$

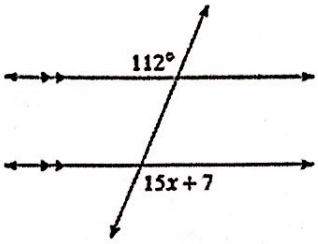
$$m\angle C = 11^\circ$$

$$x = 1$$

$$m\angle D = 11^\circ$$

Solve for x.

44)

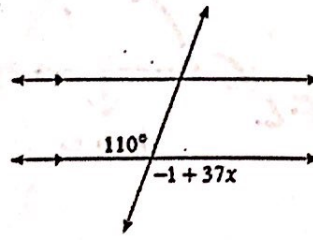


$$15x + 7 = 112$$

$$15x = 105$$

$$x = 7$$

45)

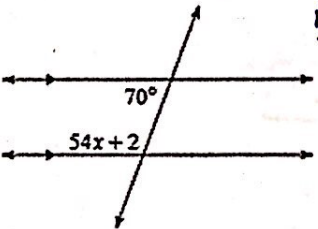


$$110 = -1 + 37x$$

$$111 = 37x$$

$$x = 3$$

46)

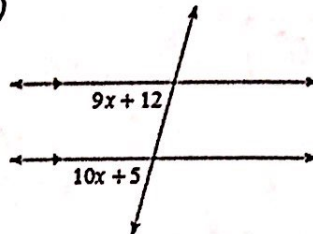


$$54x + 2 + 70 = 180$$

$$54x = 108$$

$$x = 2$$

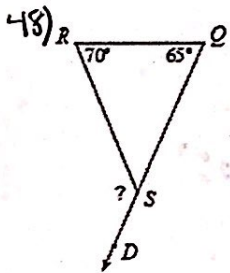
47)



$$9x + 12 = 10x + 5$$

$$7 = x$$

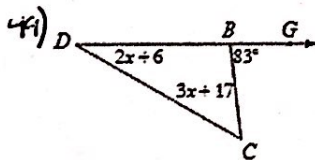
Find the measure of each angle indicated.



$$x = 70 + 65$$

$$x = 135^\circ$$

Solve for x.



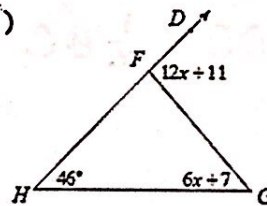
$$83 = 2x + 6 + 3x + 17$$

$$83 = 5x + 23$$

$$60 = 5x$$

$$x = 12$$

50)



$$12x + 11 = 46 + 6x + 7$$

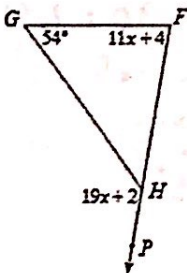
$$12x + 11 = 6x + 53$$

$$6x = 42$$

$$x = 7$$

Find the measure of the angle indicated.

51) Find  $m\angle PHG$ .



$$19x + 2 = 11x + 4 + 54$$

$$19x + 2 = 11x + 58$$

$$8x = 56$$

$$x = 7$$

$$m\angle PHG = 19(7) + 2$$

$$= 135^\circ$$

Solve each proportion.

52)  $\frac{m+5}{3m-10} = -\frac{2}{8}$

$$8m + 40 = -2(3m - 10)$$

$$8m + 40 = -6m + 20$$

$$14m = -20$$

$$m = -\frac{10}{7}$$

53)  $\frac{9}{x+5} = \frac{2}{3x-4}$

$$9(3x - 4) = 2(x + 5)$$

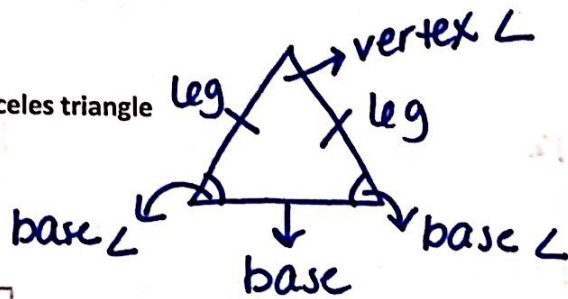
$$27x - 36 = 2x + 10$$

$$25x = 46$$

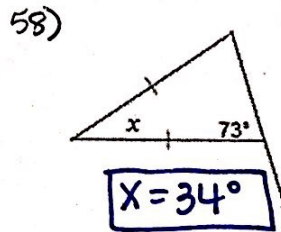
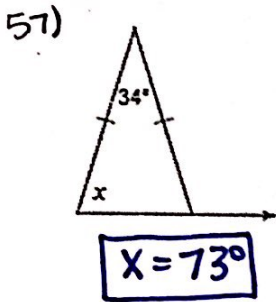
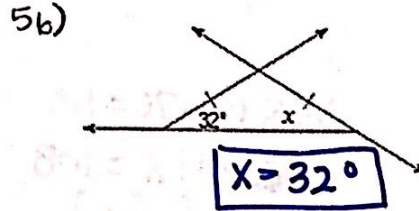
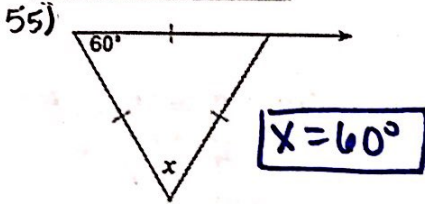
$$x = \frac{46}{25}$$



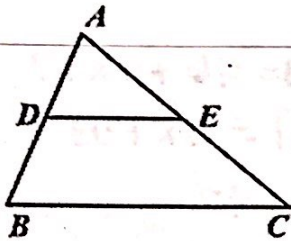
54) Draw and label an isosceles triangle



Find the value of x.



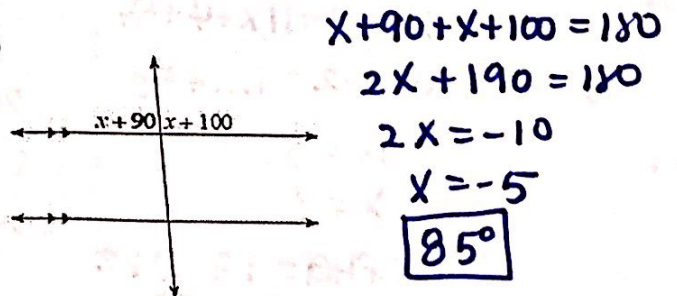
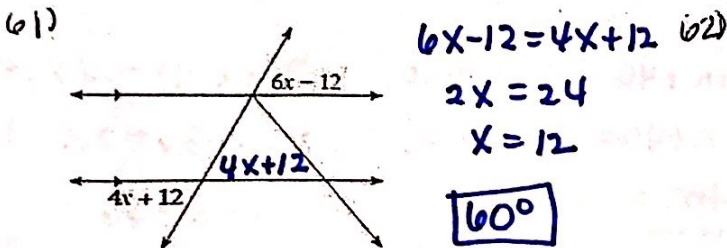
59) If a triangle is equilateral, it is also equiangular. This means that each angle is  $60^\circ$  degrees.



$DE \parallel BC$   
 $DE = \frac{1}{2} BC$

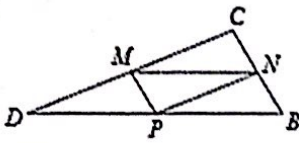
60) If DE is the midsegment of Triangle ABC, list everything you know about the above diagram.

Find the measure of the angle indicated in bold.



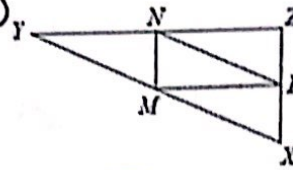
In each triangle, M, N, and P are the midpoints of the sides. Name a segment parallel to the one given.

(63)



$\overline{MP} \parallel \overline{CB}$

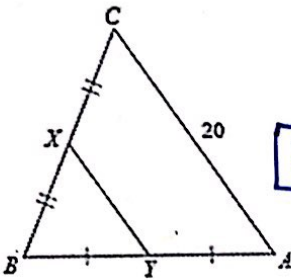
(64)



$\overline{XZ} \parallel \overline{NM}$

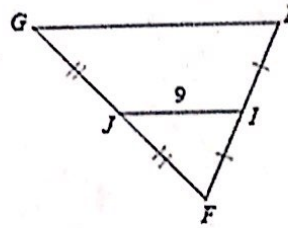
Find the missing length indicated.

(65) Find YX



$YX = 10$

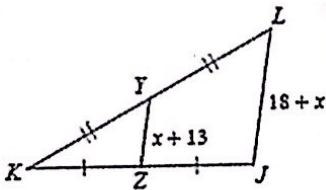
(66) Find EG



$EG = 18$

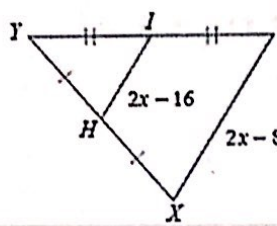
Solve for x.

(67)



$2(x+13) = 18+x$   
 $2x+26 = 18+x$   
 $x = -8$

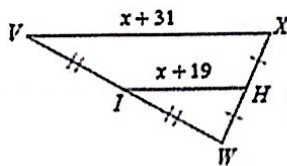
(68)



$2(2x-16) = 2x-8$   
 $4x-32 = 2x-8$   
 $2x = 24$   
 $x = 12$

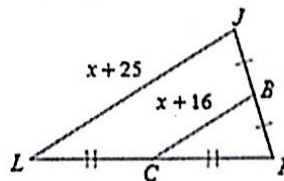
Find the missing length indicated.

(69) Find XV



$2(x+19) = x+31$   
 $2x+38 = x+31$   
 $x = -7$   
 $XV = 24$

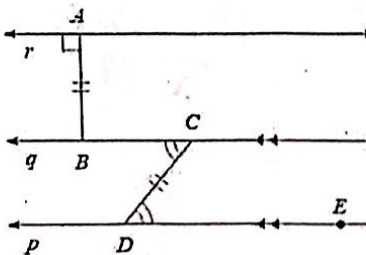
(70) Find JL



$2(x+16) = x+25$   
 $2x+32 = x+25$   
 $x = -7$   
 $JL = -7+25$   
 $JL = 18$

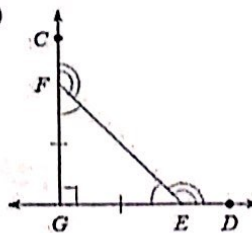
List all information given by the marks on the diagram.

(71)



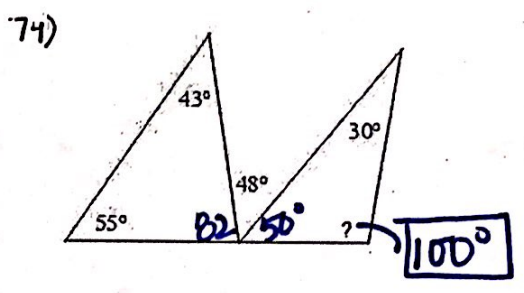
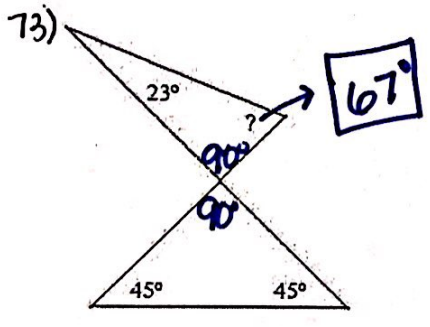
$\overline{AB} \cong \overline{BC}$   
 $r \parallel p$   
 $m\angle A = 90^\circ$   
 $r \perp \overline{AB}$   
 $\angle BCD \cong \angle CDE$

(72)

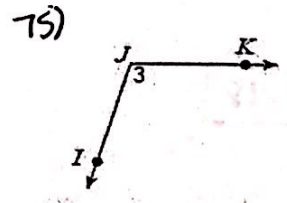


$\angle CFE \cong \angle DEF$   
 $\angle GFE \cong \angle GEF$   
 $\overline{FG} \cong \overline{GE}$   
 $FG \perp EG$

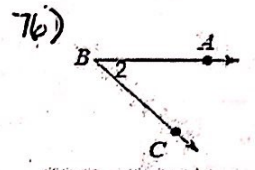
Find the measure of each angle indicated.



Name each angle in four ways.

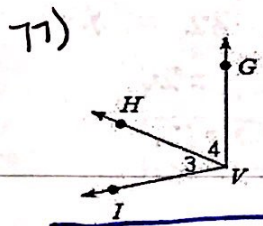


- Choose the wrong name for this angle:
- A)  $\angle 3$
  - B)  $\angle J$
  - C)  $\angle K$
  - D)  $\angle KJI$

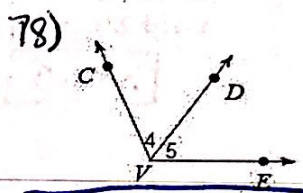


- Choose the wrong name for this angle:
- A)  $\angle BCA$
  - B)  $\angle ABC$
  - C)  $\angle B$
  - D)  $\angle 2$

Name all the angles that have V as a vertex.

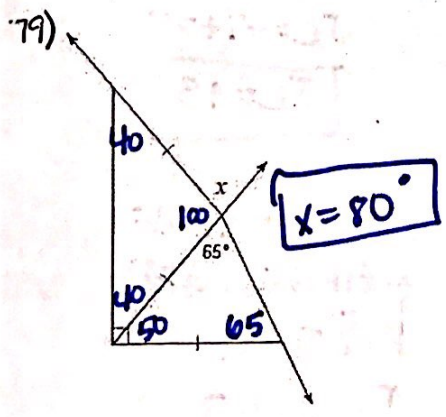


- A)  $\angle 3, \angle 4, \angle IVG$
- B)  $\angle 3, \angle 4, \angle HIV$
- C)  $\angle 3, \angle 4, \angle VGH$
- D)  $\angle 3, \angle 4, \angle GHI$

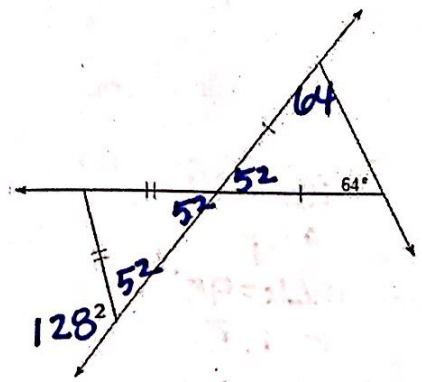


- A)  $\angle 4, \angle 5, \angle CVE$
- B)  $\angle 4, \angle 5, \angle DCV$
- C)  $\angle 4, \angle 5, \angle EDC$
- D)  $\angle 4, \angle 5, \angle VED$

Find the value of x.



80)  $m\angle 2 = 18x + 2$



$$18x + 2 = 128$$

$$18x = 126$$

$$x = 7$$