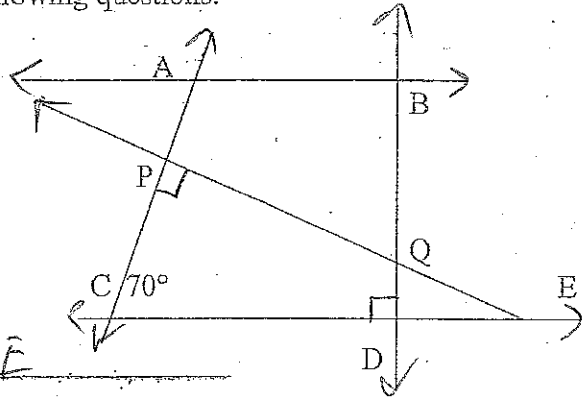


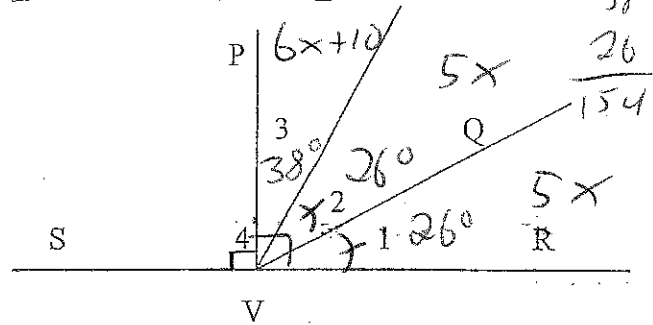
Use the diagram to the right to answer the following questions.

- 1) Name a ray DE
- 2) Name a line AB
- 3) Name an obtuse angle LBQE
- 4) Name an acute angle LPCD
- 5) Name 3 collinear points P, Q, E
- 6) Name 2 adjacent angles that are not right angles L PQB and LEQB
- 7) Name 2 supplementary angles L PQB and LEQB
- 8) Name a point in the interior of $\triangle ACD$ P



In the diagram to the right, $m\angle 1 = 26^\circ$, $m\angle 4 = 90^\circ$, and $m\angle 2 \cong m\angle 1$

- 9) $m\angle 2 = 26^\circ$
- 10) $m\angle SVQ = 154^\circ$
- 11) $m\angle 3 = 38^\circ$
- 12) $\angle 4 \cong \angle 3 + \angle 2 + \angle 1$



- 13) Using the same diagram, suppose that we still have $\angle 2 \cong \angle 1$, but that $m\angle 1 = 5x$ and $m\angle 3 = 6x + 10$. What is the value of x ? $x = 5$

$$5x + 5x + 6x + 10 = 90$$

$$16x + 10 = 90$$

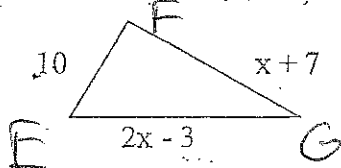
$$16x = 80$$

$$x = 5$$

How many sides are congruent in each of the following triangles?

- 14) Scalene: none
- 15) Isosceles: 2 or 3
- 16) Equilateral: all 3

- 17) If the perimeter of $\triangle EFG$ is 32, is $\triangle EFG$ scalene, isosceles, or equilateral?



$$10 + 2x - 3 + x + 7 = 32$$

$$3x + 14 = 32$$

$$3x = 18$$

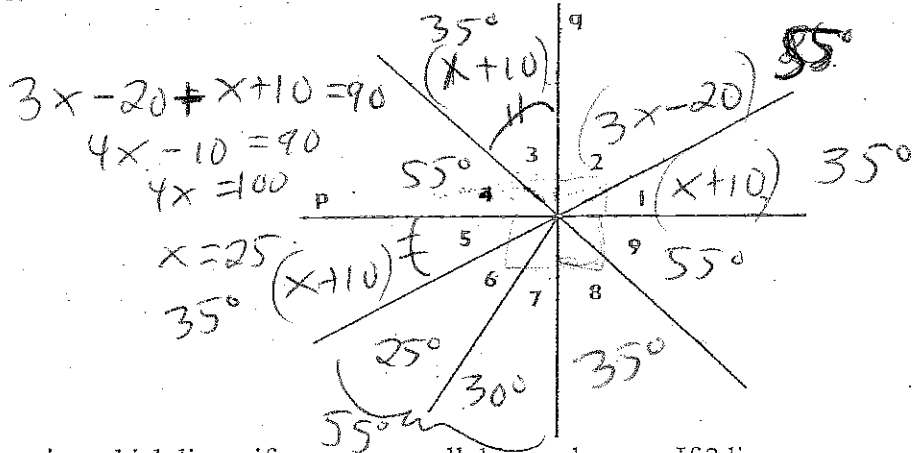
$$x = 6$$

Use inductive reasoning to find the next three terms in the sequence.

- 18) 1, 2, 3, 5, 8, 13, 21, 34, 55
add last 2 terms!

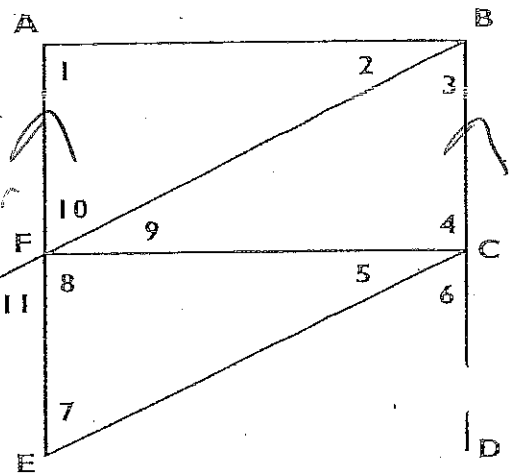
In the figure to the right, $p \perp q$, $m\angle 1 = x + 10$, $m\angle 2 = 3x - 20$, $\angle 3 \cong \angle 5$ and $m\angle 7 = m\angle 6 + 5$. Find each of the following:

- 19) $m\angle 2 = \underline{55^\circ}$
- 20) $m\angle 3 = \underline{35^\circ}$
- 21) $m\angle 6 = \underline{25^\circ}$
- 22) $m\angle 7 = \underline{30^\circ}$
- 23) $m\angle 9 = \underline{55^\circ}$



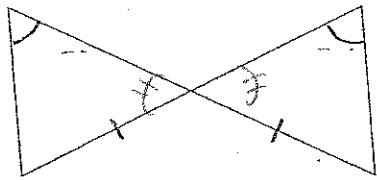
Using the figure to the right, determine which lines, if any, are parallel in each case. If 2 lines are parallel, state the reason (corresponding angles, alternate interior angles, same-side interior angles). If no lines are parallel, say "none".

	Parallel lines	Reason
24) $m\angle 3 \cong m\angle 10$	$\overline{AE} \text{ \& \ } \overline{BD}$	alternate interior
25) $m\angle 9 \cong m\angle 6$	$\overline{FB} \text{ \& \ } \overline{EC}$	alternate interior
26) $m\angle 7 \cong m\angle 10$	$\overline{FB} \text{ \& \ } \overline{EC}$	corresponding
27) $m\angle 11 \cong m\angle 3$	$\overline{AE} \text{ \& \ } \overline{BD}$	corresponding
28) $m\angle 4$ and $\angle AFC$ are right angles	$\overline{AE} \text{ \& \ } \overline{BD}$	same-side interior



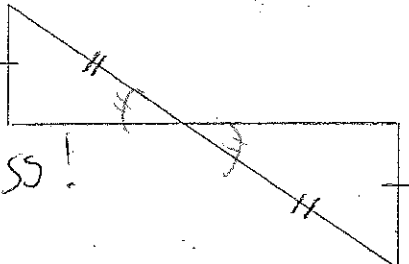
State a reason that the pair of triangles is congruent. If the pair cannot be proven congruent, state "cannot prove".

29) SAA



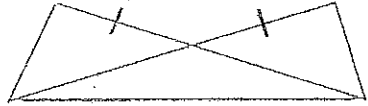
30) Cannot be determined

NO SSA or ASS!



31) Cannot be determined

not enough information!

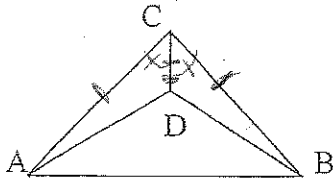


⊕ add ≅

mark your diagrams!

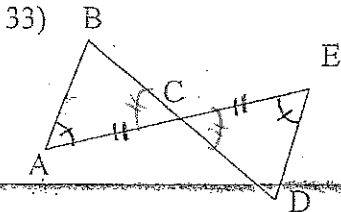
Complete the congruence statement

32) \overline{CD} bisects $\angle C$, $\overline{AC} \approx \overline{BC}$



$\triangle ACD \approx \triangle BCD$

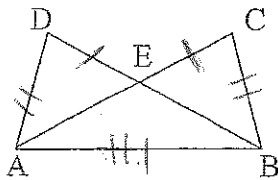
SAS



$\triangle ABC \approx \triangle EDC$

ASA

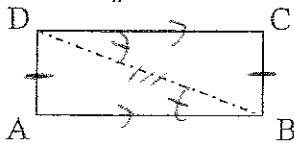
34) $\overline{AC} \approx \overline{BD}$, $\overline{AD} \approx \overline{BC}$



$\triangle ADB \approx \triangle BCA$

SSS

35) $\overline{AB} \parallel \overline{CD}$, $\overline{AD} \approx \overline{BC}$



$\triangle ADB \approx \triangle CBD$

CBD

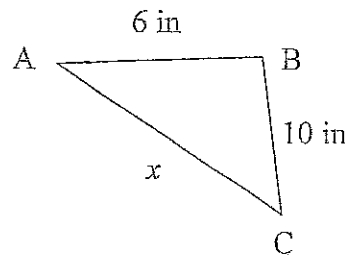
36) Can a triangle have sides of length 12, 13 and 26?

No, $25 > 26$

Use the triangle to the right to answer the following questions.

37) \overline{AC} must be smaller than what number?

16 in. $10 + 6$



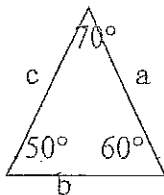
38) \overline{AC} must be larger than what number?

4 in. $10 - 6$

~~10 < x < 16~~
 $4 < x < 16$

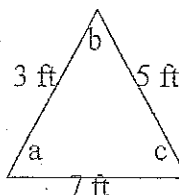
Arrange the letters in order from greatest value to least value

39)



$b > c > a$

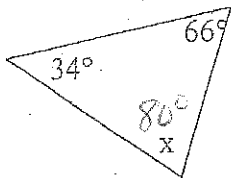
41)



$b > a > c$

Find the missing measurements in each triangle.

42) $x = 80^\circ$



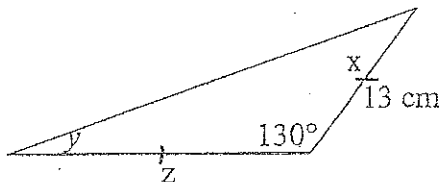
all \angle 's in a Δ add up to 180°

43) $x = 65^\circ$

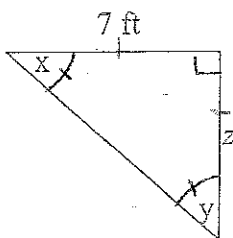


supplementary \angle 's add up to 180°

44) $x = 25^\circ$
 $y = 25^\circ$
 $z = 13 \text{ cm}$



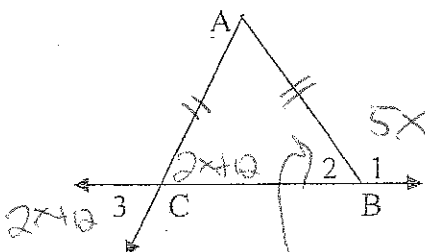
45) $x = 45^\circ$
 $y = 45^\circ$
 $z = 7 \text{ ft}$



46) Given \overline{AB} and \overline{AC} are the legs of isosceles ΔABC

$m\angle 1 = 5x$
 $m\angle 3 = 2x + 12$

Find $m\angle 2 = 9.88$



$$2x + 12 + 5x = 180$$

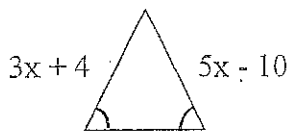
$$7x + 12 = 180$$

$$-12 \quad -12$$

$$7x = 168$$

In each triangle, determine the value of x.

47) $x = 7$



$$3x + 4 = 5x - 10$$

$$-3x \quad -3x$$

$$4 = 2x - 10$$

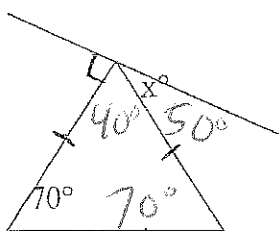
$$+10 \quad +10$$

$$14 = 2x$$

$$\frac{14}{2} \quad \frac{2x}{2}$$

$$x = 7$$

48) $x = 50^\circ$



$$14 = 2x$$

$$\frac{14}{2} \quad \frac{2x}{2}$$

$$x = 7$$

57) $\triangle ABC \sim \triangle DEF$. Find the values of x and y . Round to the nearest hundredth.

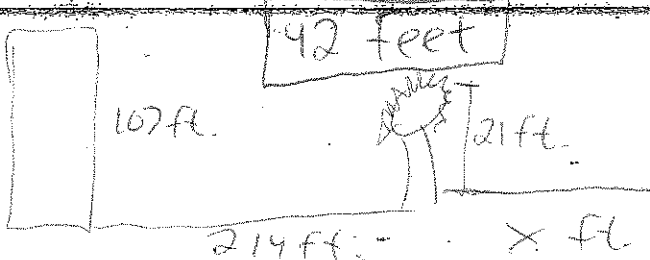
Scale factor $\frac{2}{3}$

$x = 12 \text{ ft.}$
 $y = 10 \text{ ft.}$

$15 \cdot \frac{2}{3} = \frac{30}{3} = 10$

$\frac{12}{8} = \frac{3}{2}$

58) A building is 107 feet tall and has a shadow of 214 feet. A tree in the building's shadow is 21 feet tall. Both the building's shadow and the tree's shadow share the same ending point. How long is the tree's shadow? How far away is the tree from the building?



$$\frac{107}{21} = \frac{214}{x}$$

$$4494 = 107x$$

$$x = 42$$

Use the sketch at the right to find the indicated angles.

59) $a = 152^\circ$

60) $b = 28^\circ$

61) $c = 152^\circ$

62) $d = 152^\circ$

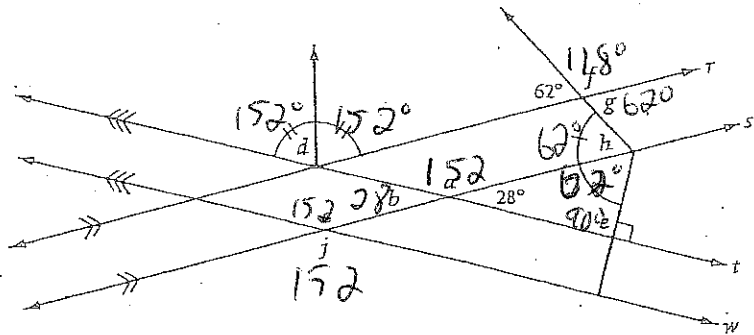
63) $e = 90^\circ$

64) $f = 118^\circ$

65) $g = 62^\circ$

66) $h = 62^\circ$

67) $j = 152^\circ$



Look for: vertical \angle 's
 supplementary \angle 's
 corresponding \angle 's
 same-side interior \angle 's
 alternate interior \angle 's
 not similar
 ✓ SSS ~

ratios have to be the same!

Determine whether each pair of triangles is similar. Justify your answer.

68)

SAS ~

69)

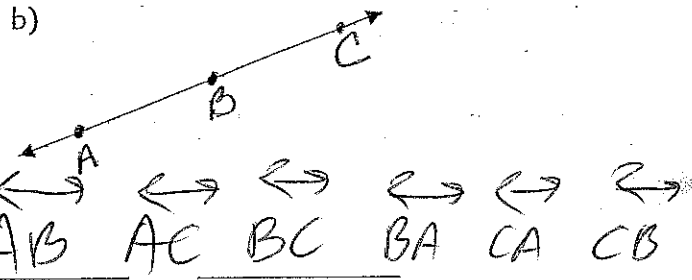
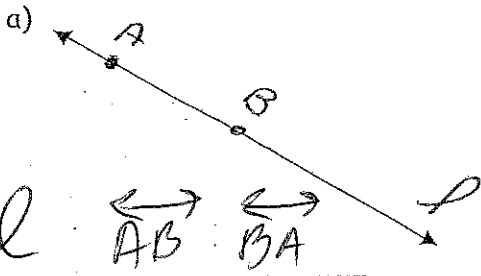
those ratios do not match!

AS
WS $\rightarrow \frac{18}{12} = \frac{3}{2}$ ✓ $\frac{24}{15} = \frac{8}{5}$ ✓

$\frac{11}{12.5}$ $\frac{14}{16} = \frac{7}{8}$ $\frac{16}{18} = \frac{8}{9}$

Part II

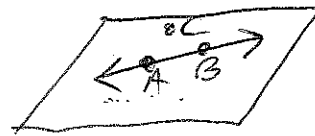
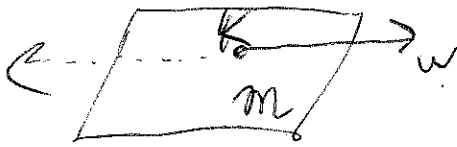
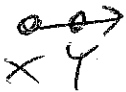
1) Name the line in two different ways:



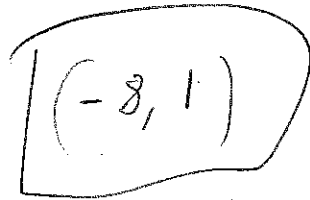
2) Draw the following figures:

2a) Ray XY

2b) Plane $M \cap w = k$ 2c) Draw \overleftrightarrow{AB} on plane ABC



3) Find the coordinates of the midpoint of the segment with this pair of given endpoints: $A(-10, 5)$ and $D(-6, -3)$.

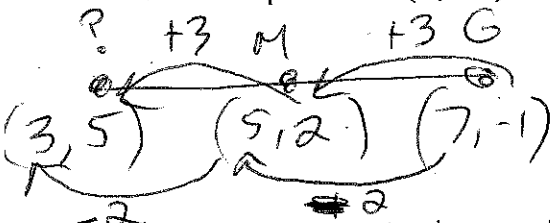
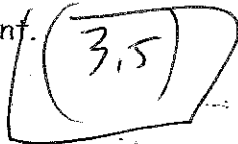


$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$\left(\frac{-10 + -6}{2}, \frac{5 + -3}{2} \right)$$

$$\left(\frac{-16}{2}, \frac{2}{2} \right) \rightarrow (-8, 1)$$

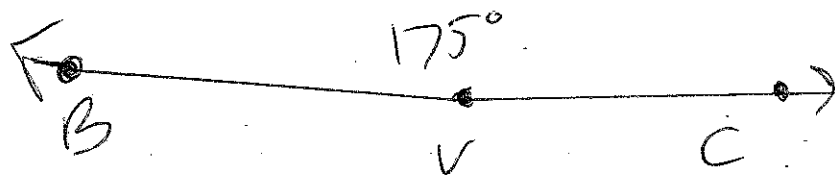
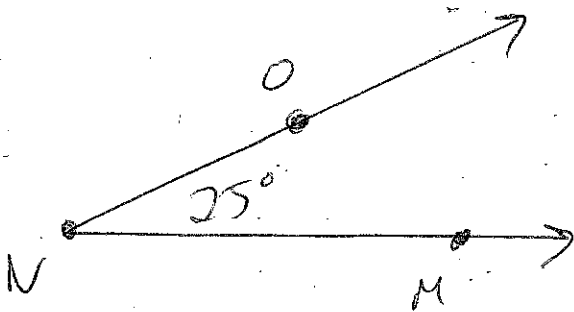
4) Find the coordinates of the endpoint given that the midpoint is $M(5, 2)$ and the other endpoint is $G(7, -1)$ of a line segment.



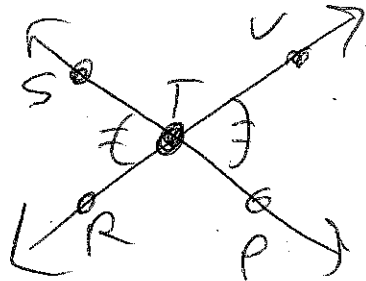
Use a protractor to draw and label each angle.

5) $m\angle MNO = 25^\circ$

6) $m\angle BVC = 175^\circ$



7) Draw vertical angles STR AND VTP = T



8) Triangle ABC has a vertex angle at $\angle C$. $AB = 5x - 4$, $BC = 2x + 3$, $AC = 4x - 3$

$$5x - 4 + 2x + 3 + 4x - 3 = 180$$

$$11x - 4 = 180$$

$$\frac{11x = 184}{11}$$

$$x = 16.72$$

$$x = 16.72$$

$$AB = 5(16.72) - 4 \approx 79.6$$

$$BC = 2(16.72) + 3 \approx 36.44$$

$$AC = 4(16.72) - 3 \approx 63.88$$

9) Find the function rule and the next term

n	1	2	3	4	5	6	.....	n	.....	20
f(n)	6	7.5	9	10.5	12	13.5	.....	$1.5x + 4.5$	.....	34.5

$$\begin{matrix} \curvearrowright & \curvearrowright & \curvearrowright \\ +1.5 & +1.5 & +1.5 \end{matrix}$$

Test $2(1.5) = 3$, to get to 7.5 I add 4.5.

$$f(n) = 1.5x + 4.5$$

10)

n	1	2	3	4	5	6	.....	n	.....	50
f(n)	0	5	12	21	32	45	.....	$(n-1)(n+3)$	.....	2597

$$0 \cdot 4 \quad 1 \cdot 5 \quad 2 \cdot 6 \quad 3 \cdot 7 \quad 4 \cdot 8 \quad 5 \cdot 9$$

$$f(50) = (50-1)(50+3)$$

$$= (49)(53)$$

$$= 2597$$

$(n-1)(n+3)$ - b/c for $\begin{matrix} 2 \\ 5 \end{matrix}$ -1.5

2 to 1 is -1
2 to 5 is +3

$$f(n) = (n-1)(n+3)$$

$$8x - 4$$

$$8(7) - 4$$

$$56 - 4$$

$$52$$

11) Given: D is the midpoint of \overline{AB}

$$AD = 4x + 4$$

$$DB = 3x - 1$$

$$AB = 8x - 4$$

Find \overline{DB} = 52

DB

12) Given: \overline{BD} bisects $\angle ABC$

$$m\angle 1 = 3x + 10$$

$$m\angle ABC = 7x + 10$$

Find $m\angle 2$ = 40°

$$3x + 10 + 3x + 10 = 7x + 10$$

$$6x + 20 = 7x + 10$$

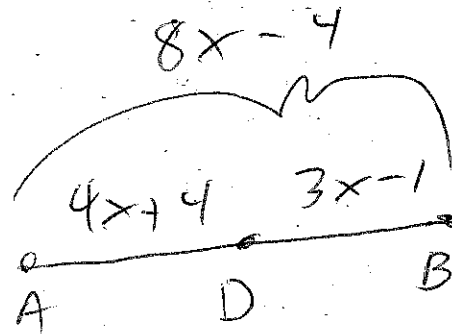
$$-6x \quad -6x$$

$$20 = x + 10$$

$$-10 \quad -10$$

$$10 = x$$

$$x = 10$$



$$4x + 4 + 3x - 1 = 8x - 4$$

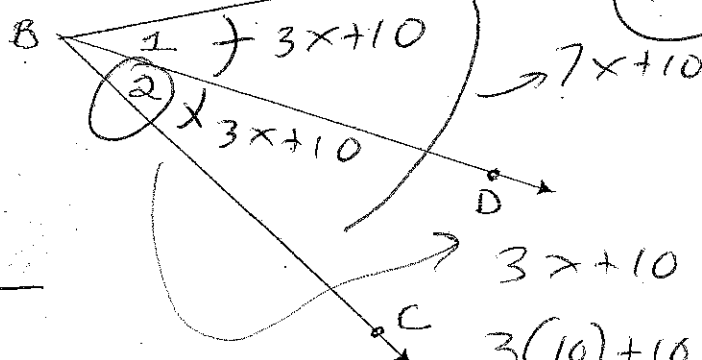
$$7x + 3 = 8x - 4$$

$$-7x \quad -7x$$

$$3 = x - 4$$

$$+4 \quad +4$$

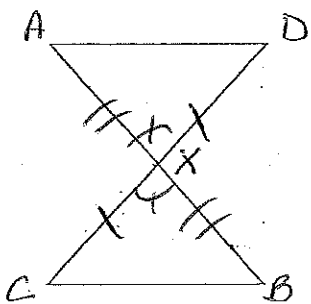
$$x = 7$$



$$3(10) + 10$$

$$30 + 10 = 40$$

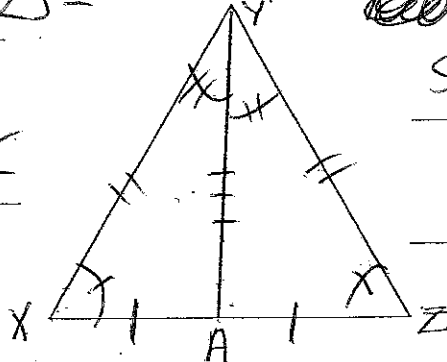
13) X is the midpoint of \overline{CD} and \overline{AB} . Is $\triangle ABC \cong \triangle DCX$? Why or Why not? Yes



SAS $\triangle \cong$

CPCTC

14) $\triangle XYZ$ is isosceles and \overline{YA} is the bisector of the vertex Angle. Is $\triangle XA \cong \triangle AZ$? Why or Why not? Yes



SAS or SSS or ASA

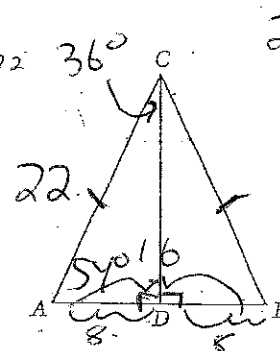
CPCTC

In Exercises 15-17, use the figure at right. $\triangle ABC$ is isosceles with $AC = BC$.

15. \overline{CD} is a median, perimeter $\triangle ABC = 60$, and $AC = 22$. $AD =$ 8

16. \overline{CD} is an angle bisector, and $m\angle A = 54^\circ$. $m\angle ACD =$ 36°

17. \overline{CD} is an altitude, perimeter $\triangle ABC = 55$, $m\angle ACD = 19^\circ$, and $AD = 8$. $m\angle B =$ 61°, $CB =$ 19.5



$$22 + 22 = 44$$

$$60 - 44 = 16$$

