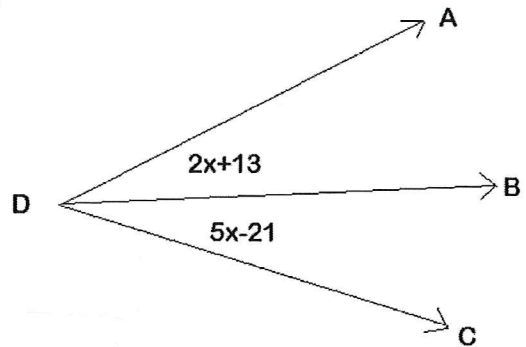**Show expected work, marks, and labels. Circle your answers!**

1.₂ $\overrightarrow{DB}$ bisects $\angle ADC$…find the value of x.

$$2x+13 = 5x-21$$
$$+21 \quad | \quad -2x$$
$$34 = 3x$$
$$\overline{\quad\quad} 3$$

$$\boxed{x=\frac{34}{3}} = 11\frac{1}{3}$$

Figure: rays from D to A (labeled 2x+13 for angle ADB), to B, and to C (labeled 5x-21), with D at the vertex.

2.₃ Find MW.

Number line: V —— M —— W, segment VM labeled 4x − 1, segment MW labeled 3x + 3.

$$4x-1 = 3x+3$$
$$-3x \quad\quad +1$$
$$x=4$$
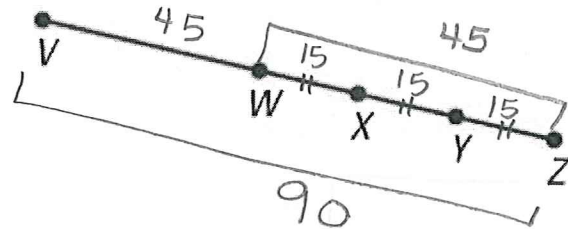
$$MW = 3x+3 = 3(4)+3$$
$$\boxed{MW = 15 \text{ units}}$$

In 3 – 6, use the figure with VZ = 90, W bisects $\overline{VZ}$, and $\overline{WX} \cong \overline{XY} \cong \overline{YZ}$ to find the lengths.
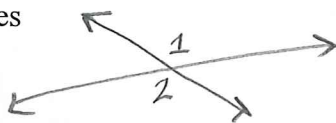
3.₁   YZ = $\boxed{15}$ 4.₁   VW = $\boxed{45}$

5.₁   VX = $\boxed{60}$ 6.₁   VY = $\boxed{75}$

Figure: line with points V, W, X, Y, Z. VW = 45, WX = 15, XY = 15, YZ = 15. Total 90.

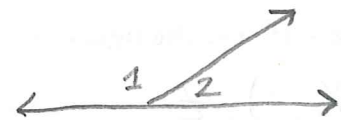**In 7 – 10, sketch an example of each pair of angles using $\angle 1$ and $\angle 2$ as the labels.**

7.₁   Vertical Angles

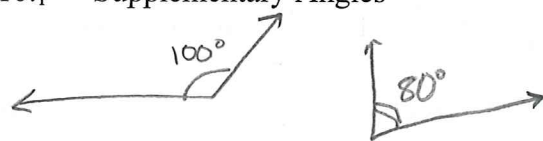*Sketch of two intersecting lines with angles 1 and 2.*

8.₁   Linear Pair

Sketch of angles 1 and 2 on a straight line.

9.₁   Complementary Angles

Sketch of angles 1 and 2 forming a right angle.
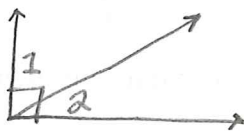
10.₁   Supplementary Angles

Sketch of a 100° angle and an 80° angle.

11.₂   For part A and B state whether the statement is true or false. Then <u>explain</u> your decision.

A)   If points are collinear then they are coplanar. True or False? _____True_____
Explain: ___If points lie on the same line (collinear) then they will lie in a common plane (coplanar).___

B)   If points are coplanar then they are collinear. True or False? _____False_____
Explain: ___3 pts. that form a triangle are coplanar, but not collinear___

In 12 and 13, m∠DOG = 10x + 55 and m∠DOC = 6x + 5 and the two angles are supplementary.

12.₃ Sketch the situation and find the measures of ∠DOG and ∠DOC.

13.₂ Classify ∠DOG and ∠DOC and explain.

$6x+5 + 10x+55 = 180$

$16x + 60 = 180$

$-60 \quad -60$

$\dfrac{16x}{16} = \dfrac{120}{16}$

$x = 7.5$

$6x+5 \quad 10x+55$

$\overleftrightarrow{C \quad O \quad G}$
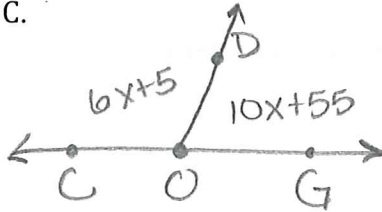
$DOG = 10(7.5) + 55$

$\boxed{m∠DOG = 130°}$

$DOC = 6x+5 = 6(7.5)+5$

$\boxed{m∠DOC = 50°}$

∠DOG is $\boxed{\text{obtuse}}$ because $\underline{130° > 90°}$

∠DOC is $\boxed{\text{acute}}$ because $\underline{50° < 90°}$

14.₃ ∠1 and ∠2 are complementary angles. Find m∠1 if m∠2 is triple m∠1.

$m∠1 + m∠2 = 90$

$X + 3X = 90$

$4X = 90$

$X = 22.5$

$\boxed{m∠1 = 22.5°}$ $m∠2 = 3(22.5)$
$= 67.5°$

15.₂ In $\overline{LA}$, L(7,-1) & has midpoint X(1,4). Find the coordinates of endpoint A.

$\underset{(7,-1)}{L} \qquad \underset{(1,4)}{X} \qquad \underset{(x,y)}{A}$

$-6 \quad +5 \qquad -6 \quad +5$
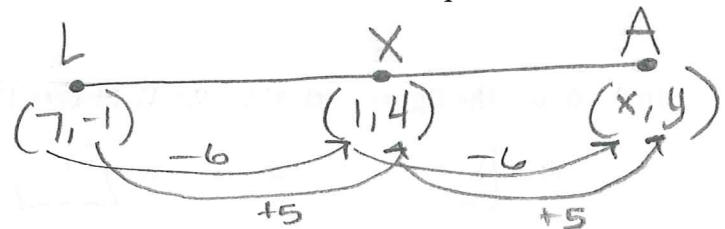
$X = 1-6 = -5$

$y = 4+5 = 9$

$\boxed{A(-5, 9)}$

In 16 – 19, use the figure at the right and use proper notation.

$\underline{X, Y, Z}$ 16.₁ Name 3 points that a collinear.

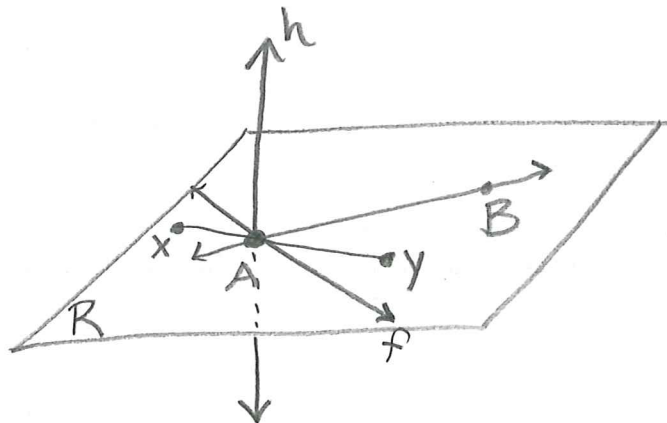$\underline{\overrightarrow{YX}, \overrightarrow{YZ}}$ 17.₁ Name a pair of opposite rays.

$\underline{\text{line } h, \overleftrightarrow{YP}}$ 18.₂ Give two other names for $\overleftrightarrow{PY}$

$\underline{\text{plane } M}, \underline{\text{plane } YNZ}, \underline{\text{plane } XNZ}$ 19.₂ Name the plane shown three different ways.
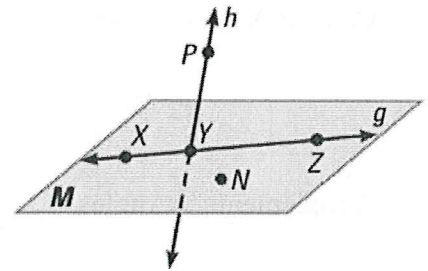
20.₃ Sketch the following…

Plane R, containing $\overleftrightarrow{AB}$ and line f.
Line f, $\overline{XY}$ and $\overleftrightarrow{AB}$ intersect at point A.
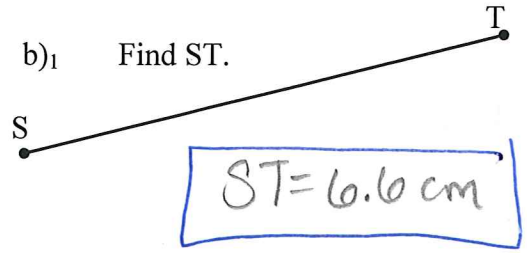Line h also intersects at point A, but does not lie in plane R.

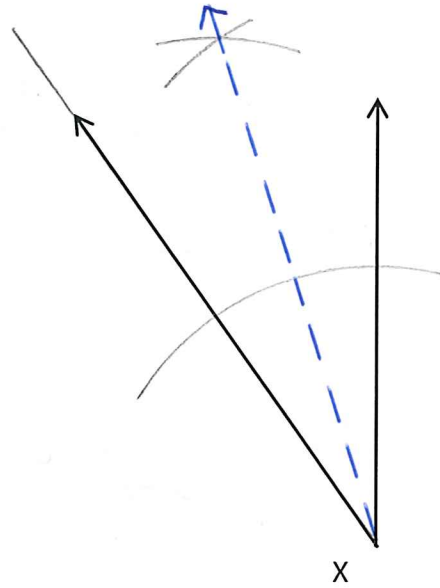21. Get a ruler!

a)₁ Draw $\overline{BE}$ 3.7 cm in length.

B ————————— E

3.7cm

b)₁ Find ST.

T

S

ST = 6.6 cm
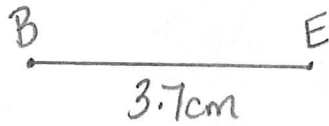
22. ∠X is given.
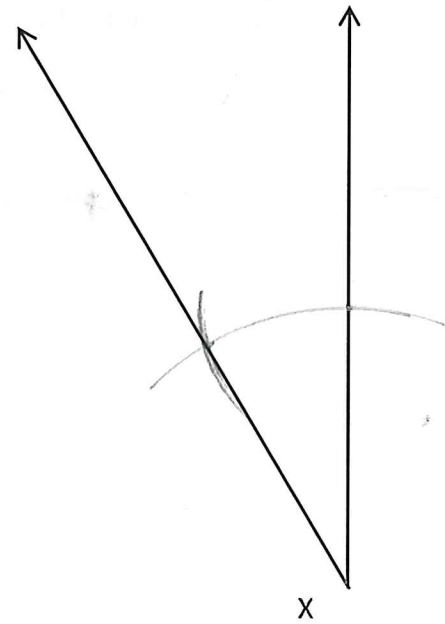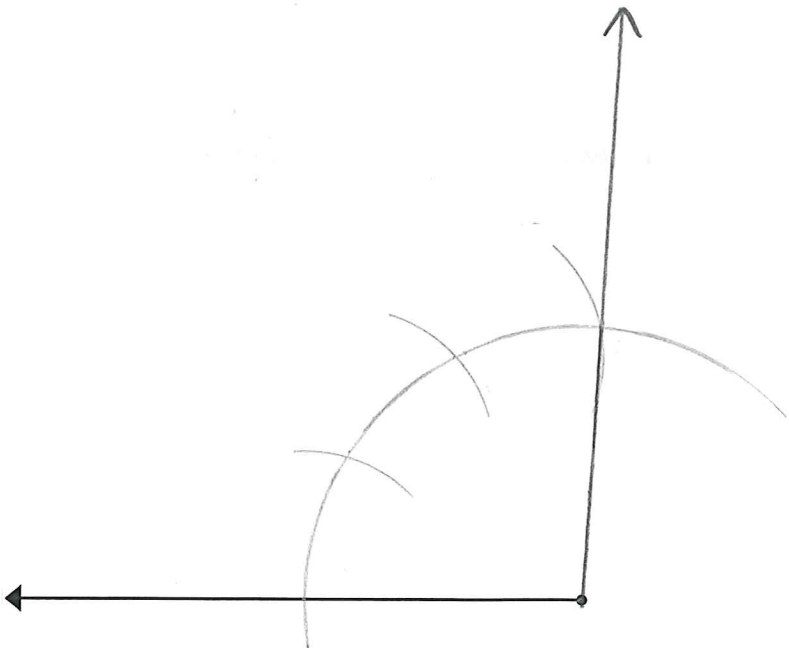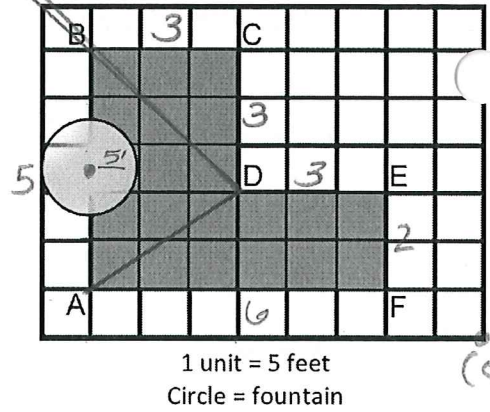
a)₁ Find the measure of angle X to the nearest degree.

m∠X = 35°

b)₂ Construct the bisector.

X

23.₃ ∠X is given. Use the workline to construct 3 · m∠X.

X

24.9   A landscaping company is designing a courtyard with a circular fountain. The courtyard's perimeter is shown by the shaded region.

<u>Hexagon</u>   a. Classify the polygon shape of the courtyard.

<u>$\overline{BC} \cong \overline{CD} \cong \overline{DE}$</u>   b. Identify any congruent line segments formed by the courtyard.

<u>NONE</u>   c. Tell whether the courtyard appears to be equilateral, equiangular, regular, or none.

1 unit = 5 feet
Circle = fountain

A(<u>-8</u>, <u>1</u>)   B(<u>-8</u>, <u>6</u>)   d. Draw axes on the grid with (0, 0) at the bottom right corner.
C(<u>-5</u>, <u>6</u>)   D(<u>-5</u>, <u>3</u>)   Give the coordinate of the vertices of the courtyard.
E(<u>-2</u>, <u>3</u>)   F(<u>-2</u>, <u>1</u>)

<u>(-8, 3.5)</u>   e. The center of the courtyard's fountain is the midpoint of $\overline{AB}$. Give the coordinates of the center of the fountain.

<u>77°</u>   f. Find the measure of ∠ADB, using a protractor.

<u>∠DEF, ∠E</u>   g. Give the two other names for ∠FED

<u>78.5 ft²</u>   h. Find the area of the courtyard's fountain, in terms of feet.

$$A = \pi r^2 = \pi(5)^2 = 25\pi \approx 78.539$$

<u>31.4 ft</u>   i. Find the circumference of the courtyard's fountain, in terms of feet.

$$C = 2\pi r$$
$$= 2\pi(5) = 10\pi \approx 31.415$$