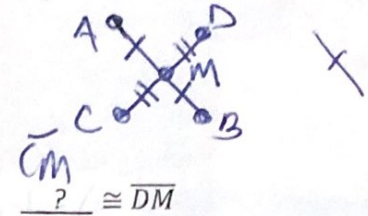# Collinear, Midpoint, Lines, Rays, etc...

name_____

class_____ date_____

1. A. If it is given that $\overline{AB}$ and $\overline{CD}$ bisect each other at M, draw a possible image below. Be sure to include proper notation to show that the segments are congruent (≅).

   $$\overline{CM} \cong \overline{DM} \qquad \overline{AM} \cong \overline{BM}$$

   B. Fill in the blanks that make the following statements true

   $A - M - \underset{?}{\overset{B}{\_\_}}$ $\underset{?}{\overset{D}{\_\_}} - M - C$ $\overline{AM} \cong \underset{?}{\overset{\overline{BM}}{\_\_}}$ $\underset{?}{\overset{\overline{CM}}{\_\_}} \cong \overline{DM}$

2. The coordinate of an endpoint of a segment is 4, and the coordinate of its midpoint is 7. What is the coordinate of the other endpoint?
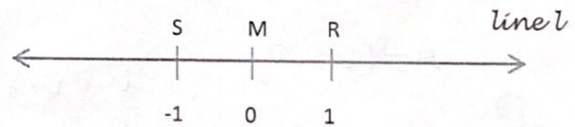
   10

3. What symbol is missing over AB in the following statements?
   a. $\overset{\rightarrow}{AB}$ has no endpoints
   b. The endpoints of $\overline{AB}$ are A and B
   c. $\overset{\rightarrow}{AB}$ has one endpoint, A

4. Name the ray or segment that is the set of all points that satisfy each of the following:
   a. $x \geq 0$ $\overrightarrow{MR}$
   b. $x \leq 0$ $\overrightarrow{MS}$
   c. All real numbers $\overleftrightarrow{SR}$
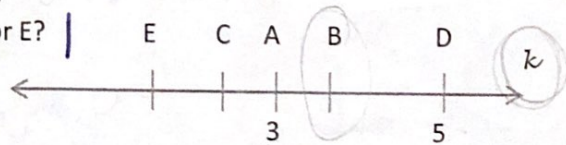   d. $0 \leq x \leq 1$ $\overline{MR}$

   S   M   R   line l

   -1   0   1

5. Find the coordinates for the midpoint of $\overline{PQ}$, if the endpoints of P and Q are...
   a. 5 and 11   **8**
   b. -9 and -2   **−5.5**
   c. $1/2$ and $2/3$ **$7/12$**
   d. -3 and 7   **2**

6. Use the diagram below to supply the missing details
   a. $\overrightarrow{AD}$ is the set of all points of line k having coordinates ≥ _**A or 3**_
   b. If B is on $\overline{AD}$, then its coordinate is _**> 3**_
   c. If $E - A - B$, then what is a possible value for E?   **|**

   E   C   A   B   D   k

           3   5

7. Using the following diagram, give a combined, simpler name for the unions and intersections of the indicated sets. (Points, lines, segments, rays, etc...)

   A   B   C   D   E   F   G   j
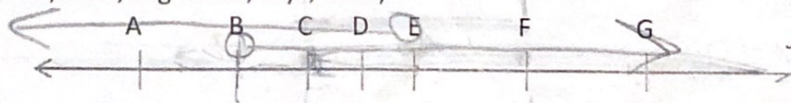
   a. $\overrightarrow{CF} \cap \overline{CF}$ c. $\overrightarrow{CF} \cup \overrightarrow{CA}$ e. $\overline{BE} \cup \overrightarrow{CF}$ g. $\overrightarrow{CA} \cap \overrightarrow{DE}$
        $\overline{CF}$ **$\overleftrightarrow{FA}$**   **$\overrightarrow{BF}$**   **ϕ** **(NO INTERSECTION)**

   b. $\overrightarrow{CF} \cup \overline{CF}$ d. $\overline{BE} \cap \overrightarrow{ED}$ f. $\overrightarrow{CF} \cap \overline{CF}$ h. $\overrightarrow{CB} \cap \overrightarrow{CE}$
        $\overrightarrow{CF}$ **$\overline{BE}$**   **$\overline{CF}$**   **C**

8. A, B, and C are three points on a number line with coordinates 3, 14, and 82 respectively. Verify that $\overline{AB} + \overline{BC} = \overline{AC}$ NOTE: This is known as the segment addition postulate.

$A \;\bullet\!\!-\!\!-\!\!\overset{B}{\bullet}\!\!-\!\!-\!\!-\!\!-\!\!-\!\!-\!\!\overset{C}{\bullet}$
$\;\;3\;\;14\;\;\;\;\;\;\;\;82$ $AB = 11$ $11 + 68 = 79$ $AC = 79$
$BC = 68$
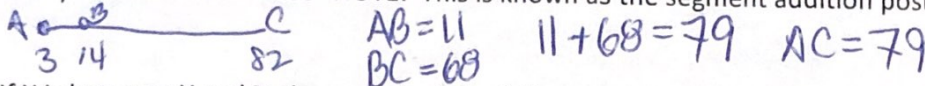
9. If X is between Y and Z, then which of the following is true?
   a. $\overline{XY} + \overline{YZ} = \overline{XZ}$ b.) $\overline{XZ} + \overline{YX} = \overline{YZ}$ c. $\overline{XY} = \overline{XZ}$ d. $\overline{XZ} + \overline{YZ} = \overline{XY}$
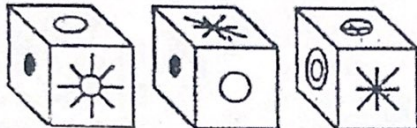
   SEGMENT ADDITION POSITION

10. Two points are 7 units apart on a number line. The coordinate of one point is -8. John thinks that the other point is -1. Sam thinks the other point is -15. Who do you agree with? Explain your reasoning.

    BOTH ARE CORRECT

11. Given four collinear points A, K, O and Y; K is between O and A; the length of $\overline{AO}$ added to the length of $\overline{AY}$ is equal to the length of $\overline{OY}$; A is to the right of O. Show a correct diagram.

    OKAY

12. Three views of the same cube are given. Which symbols are on opposite faces of the cube?

    ✳ ⇔ ✳
    ○ ⇔ ◎
    ● ⇔ ⊕

13. $\overline{AB}$ = 16, $\overline{BC}$ = 8, $\overline{AC}$ = 24 inches. Which point is between the other two? Explain your reasoning.

    A—B—C , BY SEGMENT ADDITION POSTULATE

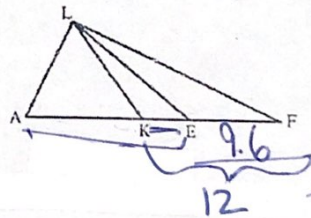14. F is between A and E; F is also between R and S; A, E, R, and S are NOT collinear. Show one correct diagram.

15. In the figure to the right, K is between A and E. E is between K and F.
    a. If $\overline{AE}$ = 10, $\overline{KF}$ = 12 and $\overline{AF}$ = 19.6 feet, find $\overline{KE}$.

       12 − 9.6 = 2.4 feet

    b. If $\overline{AE}$ = 15x, $\overline{KF}$ = 19x and $\overline{AF}$ = 30x inches, find $\overline{KE}$.

       4x inches

16. In the number line at the right, B is between A and C.
    a. If $\overline{AC}$ = 100 units, find x.

       X = 96 u

    b. If $\overline{AB} = \overline{BC}$, find x.

       X = 38 u