1.2 Measuring Segments

NOTES:

$$\overline{ST} =$$

$$ST =$$

Equal versus Congruent

$AB = 4\ cm$

$BC = 4\ cm$

ΔABC is isosceles
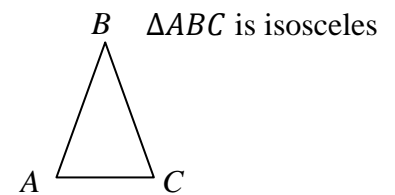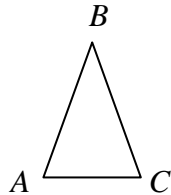
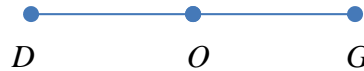| Term	Picture
Midpoint = The point that divides a segment into	A is the midpoint of $\overline{CT}$
Segment bisector = A point, line or ray that	$\overrightarrow{KE}$ is the segment bisector of $\overline{JO}$

Given O is the midpoint of $\overline{DG}$

$\quad DO = 6x - 7$

$\quad OG = 5x + 1$

Find DG

Coordinate Geometry

EASY

A (-5,3)

B (-1,3)

NOT SO EASY

C (-6,-5)

D (7,3)
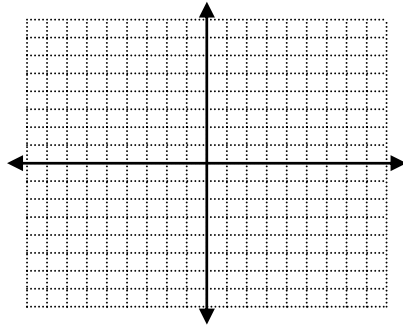
Midpoint of $\overline{AB}$ =

Distance of $\overline{AB}$ =
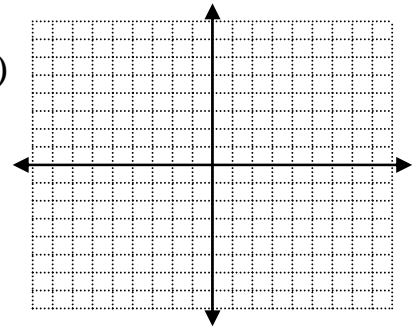
Midpoint of $\overline{CD}$ =

Distance of $\overline{CD}$ =

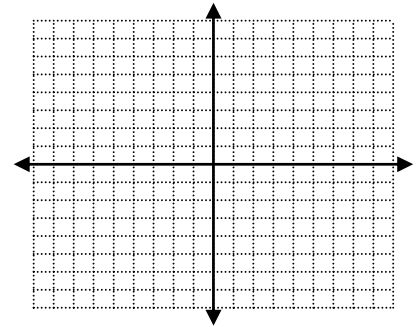## The Midpoint Formula

The Distance Formula

$\overline{ME}$ has the endpoints of *M*(-6, 4) and *E*(5, -2). Find the midpoint and distance of *ME*.

Midpoint of $\overline{ME}$ =
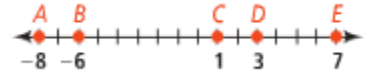
Distance of $\overline{ME}$ =

Summarize your notes:
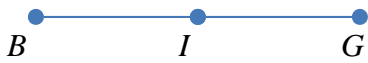
1.2 PRACTICE

For questions 1-4, use the picture on the right

1. Find AB

2. Find EC

3. What is the midpoint of $\overline{CE}$?

4. Is $\overline{BD} \cong \overline{CA}$? Explain why or why not?

Label the picture, then find the length of the given segment.

5.

I is the midpoint of $\overline{BG}$
$BI = 4y + 8$
$IG = 20$
Find BG

6.
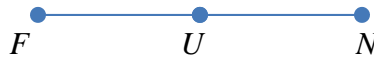
$\overline{FU} \cong \overline{UN}$
$FU = 5x + 3$
$UN = 7x - 9$
Find FN

7.
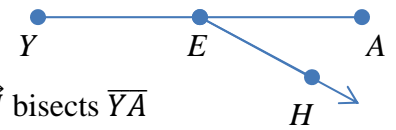
$\overrightarrow{EH}$ bisects $\overline{YA}$
$EA = 2x + 5$
$YE = 3x - 9$
Find YA

For questions 8 and 9, use the picture on the right

11. If $AD = 12$ and $AC = 4y - 36$, find the value of y. Then find AC and DC.

12. If $ED = x + 4$ and $DB = 3x - 8$, find ED, DB, and EB.

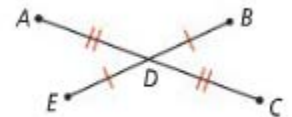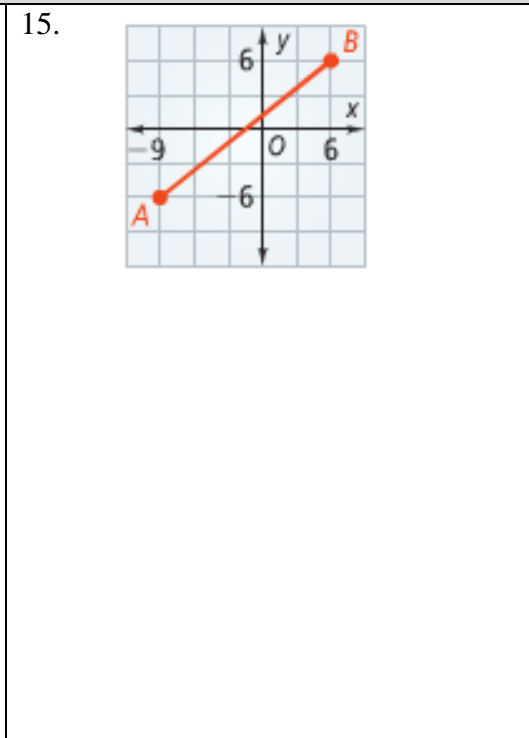| **Find the midpoint and distance given the two endpoints**		
13. (12,15) and (-8, -22)	14. (-3,5) and (14, 28)	15.

Draw and label a picture for each of the following. Indicate what line segments are congruent (if any).		
16. A is the midpoint of $\overline{HT}$	17. $\overline{DQ}$ bisects $\overline{RF}$ at M	18. $\overrightarrow{TM}$ bisects $\overline{WE}$ at T

ALGEBRA REVIEW		
SOLVE $2 + \dfrac{x}{3} = 10$	**GRAPH** $y = -\dfrac{3}{4}x - 2$	**MULTIPLY** **(distribute)** $-2(2x - 3)$
SOLVE $3 + 2y = 5y - 9$	**GRAPH** $x = 4$	**FACTOR** **Factor out the greatest common factor (undistribute)** $9x^2 + 12$
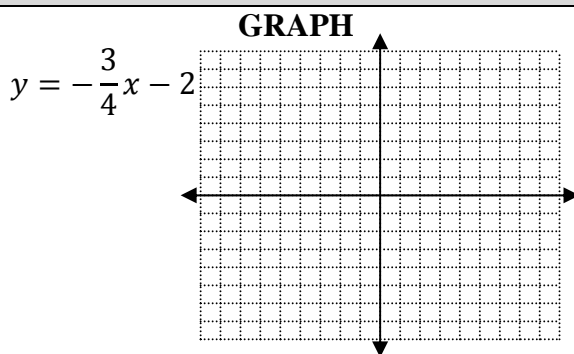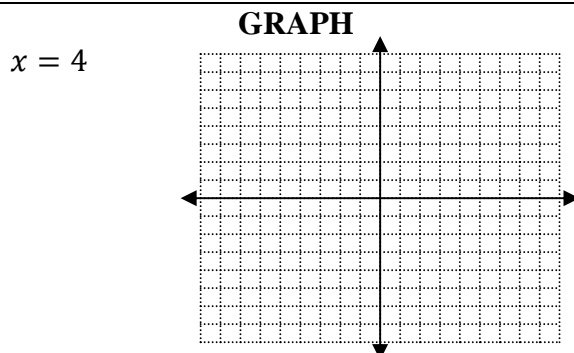
1.2 APPLICATION

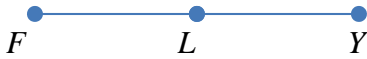| 1. Label the picture and find the missing segment.	2. Find the distance and midpoint between the two endpoints.
F L Y L is the midpoint of $\overline{FY}$ $FL = 6x - 9$ $LY = 3x + 3$ Find x and then find FL, LY, and FY	(14,-8) and (4,12)

Watch the application walk through video if you need extra help getting started!

3. **MAP**

Since Mr. Kelly gets lost so easily he decides to lay a coordinate system over the map to help him navigate. Point H is Mr. Kelly's house and point N is where Mr. Kelly's favorite nail salon where he gets his manicures and pedicures.

a. Find the distance between Mr. Kelly's house and his nail salon.

b. Mr. Kelly always has time for a facial which is conveniently located in the exact middle between his house and his nail salon. Find the coordinates of his facial and label it on the graph point F.
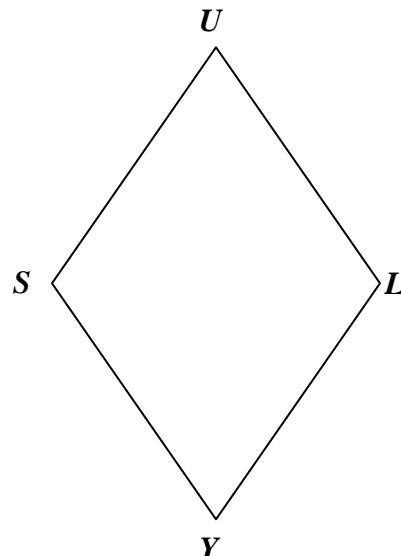
4. **Geometric Shape**

Mr. Sullivan is really into fancy bling. He picks up the diamond (rhombus) shown below and starts thinking.

Mark the following on the picture.
   a. $\overline{SU} \cong \overline{UL} \cong \overline{LY} \cong \overline{YS}$

   b. Draw $\overline{UY}$ bisects $\overline{SL}$ at C

   c. C is the midpoint of $\overline{UY}$

Find the following…
   d. $SU = 2x + 6$ and $UL = 9 - x$
      Find x and SU

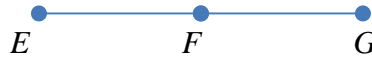   e. What is the perimeter of rhombus $SULY$?

5. Proof

Label the picture and fill in the missing reasons in the two column proof.

Given: F is the midpoint of $\overline{EG}$
$$EF = 8x - 14$$
$$FG = 4x + 1$$

$E \qquad F \qquad G$

Prove: $x = \dfrac{15}{4}$

STATEMENT	REASON
1. F is the midpoint of $\overline{EG}$ $EF = 8x - 14$ $FG = 4x + 1$	1.
2. $\overline{EF} \cong \overline{FG}$	2.
3. $8x - 14 = 4x + 1$	3.
4. $4x - 14 = 1$	4.
5. $4x = 15$	5.
6. $x = \dfrac{15}{4}$	6.

Some possible reasons:

- Given
- Addition Property of Equality
- Subtraction Property of Equality
- Multiplication Property of Equality
- Division Property of Equality
- Substitution
- Distributive Property
- Combine like terms
- Definition of _____
- _____ Postulate
- _____ Theorem

6. Coordinate Geometry
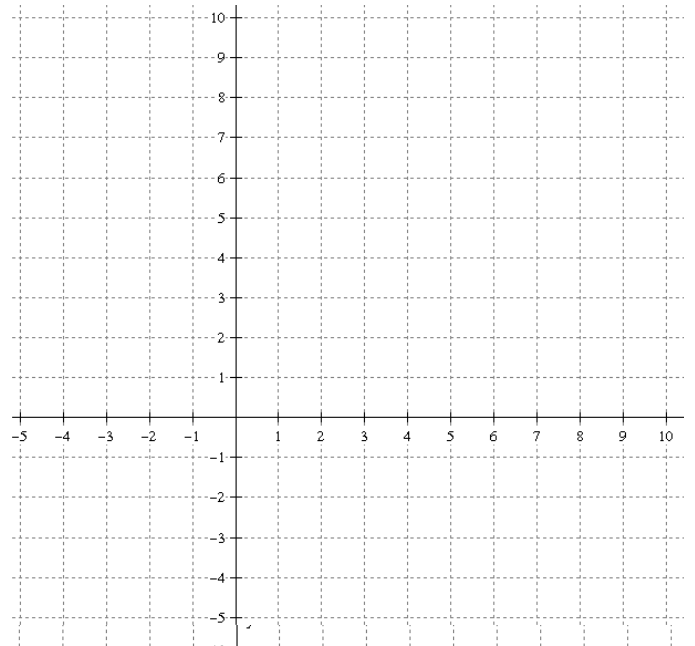
a. Graph the points
   $M(-2, 4)$
   $A(6, 4)$
   $T(6, -3)$
   $H(-2, -3)$

b. Connect the points in order to make a rectangle.

c. Draw in the diagonals $\overline{MT}$ and $\overline{AH}$.

d. Find the length of the diagonals $\overline{MT}$ and $\overline{AH}$.

e. Find the midpoints of both diagonals $\overline{MT}$ and $\overline{AH}$.

f. What appears to be true about the diagonals of the rectangle?