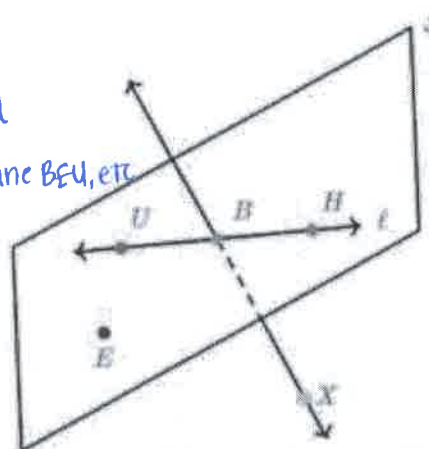


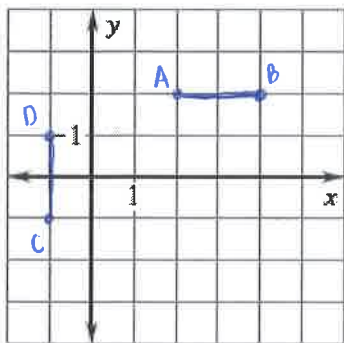
Use the diagram below to answer questions #1 – 5.

1. Please give two other names for \overleftrightarrow{UB} . $\overleftrightarrow{BH}, \overleftrightarrow{UH}, \overleftrightarrow{HU}, \overleftrightarrow{BU}$, line l
2. Please give another name for Plane UBE. Plane S , Plane BHE , Plane BEU , etc
3. Please give another name for \overleftrightarrow{HB} . \overleftrightarrow{HU}
4. Please name the intersection of plane S and \overleftrightarrow{BX} . Point B
5. Please name three collinear points. U, B, H
↳ on the same line



Plot the given points in a coordinate plane. Then determine whether the line segments named are congruent.

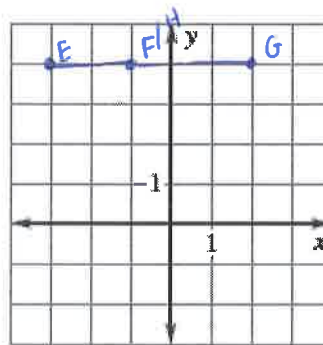
6. $A(2, 2), B(4, 2), C(-1, -1), D(-1, 1)$;
 \overline{AB} and \overline{CD}



$AB = 2$
 $CD = 2$

$\overline{AB} \cong \overline{CD}$

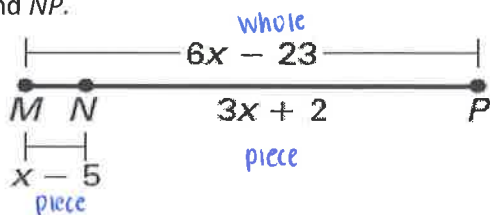
7. $E(-3, 4), F(-1, 4), G(2, 4), H(-1, 4)$;
 \overline{EF} and \overline{GH}



$EF = 2$
 $GH = 3$

$\overline{EF} \not\cong \overline{GH}$

8. Find NP .



$$MN + NP = MP$$

$$x - 5 + 3x + 2 = 6x - 23$$

$$4x - 3 = 6x - 23$$

$$-4x \quad -4x$$

$$-3 = 2x - 20$$

$$+23 \quad +23$$

$$\frac{20}{2} = \frac{2x}{2}$$

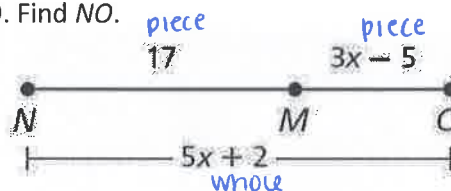
$x = 10$

$$NP = 3(10) + 2$$

$$= 30 + 2$$

$NP = 32$

9. Find NO .



$$NM + MO = NO$$

$$17 + 3x - 5 = 5x + 2$$

$$12 + 3x = 5x + 2$$

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

$$12 = 2x + 2$$

$$-2 \quad -2$$

$$\frac{10}{2} = \frac{2x}{2}$$

$x = 5$

$$NO = 5(5) + 2$$

$$= 25 + 2$$

$NO = 27$

Point J is between H and K on \overline{HK} . Use the given information to write an equation in terms of x . Solve the equation. Then find HJ and JK .

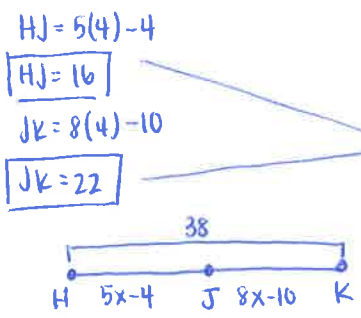
10. $HJ = 5x - 4$
 $JK = 8x - 10$
 $KH = 38$

$$HJ + JK = HK$$

$$5x - 4 + 8x - 10 = 38$$

$$13x - 14 = 38$$

$$\begin{array}{r} 13x - 14 = 38 \\ +14 \quad +14 \\ \hline 13x = 52 \\ \frac{13x}{13} = \frac{52}{13} \\ x = 4 \end{array}$$

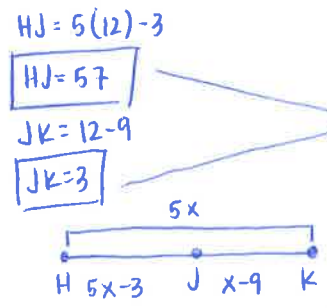


11. $HJ = 5x - 3$
 $JK = x - 9$
 $KH = 5x$

$$5x - 3 + x - 9 = 5x$$

$$6x - 12 = 5x$$

$$\begin{array}{r} 6x - 12 = 5x \\ -6x \quad -6x \\ \hline -12 = -1x \\ \frac{-12}{-1} = \frac{-1x}{-1} \\ x = 12 \end{array}$$



Find the coordinates of the midpoint of the segment with the given endpoints.

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

12. $A(6, -3)$ and $B(10, 5)$

$$M = \left(\frac{6+10}{2}, \frac{-3+5}{2} \right) = \left(\frac{16}{2}, \frac{2}{2} \right) = (8, 1)$$

13. $M(14, 7)$ and $N(-9, 1)$

$$M = \left(\frac{14+(-9)}{2}, \frac{7+1}{2} \right) = \left(\frac{5}{2}, \frac{8}{2} \right) = (2.5, 4)$$

14. $Y(-13, 8)$ and $Z(2, -10)$

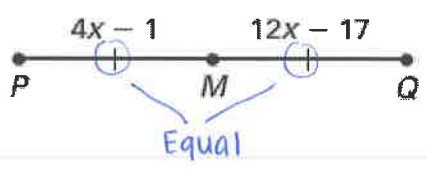
$$M = \left(\frac{-13+2}{2}, \frac{8+(-10)}{2} \right) = \left(\frac{-11}{2}, \frac{-2}{2} \right) = (-5.5, -1)$$

15. $C(-5, -17)$ and $D(-18, 12)$

$$M = \left(\frac{-5+(-18)}{2}, \frac{-17+12}{2} \right) = \left(\frac{-23}{2}, \frac{-5}{2} \right) = (-11.5, -2.5)$$

In the diagram, M is the midpoint of the segment. Find the indicated length.

16. Find MQ .



$$4x - 1 = 12x - 17$$

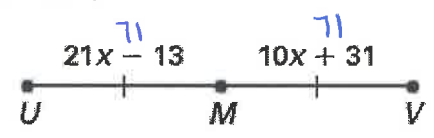
$$\begin{array}{r} 4x - 1 = 12x - 17 \\ -4x \quad -4x \\ \hline -1 = 8x - 17 \\ +17 \quad +17 \\ \hline 16 = 8x \\ \frac{16}{8} = \frac{8x}{8} \\ x = 2 \end{array}$$

$$MQ = 12(2) - 17$$

$$= 24 - 17$$

$$MQ = 7$$

17. Find UV .



$$21x - 13 = 10x + 31$$

$$\begin{array}{r} 21x - 13 = 10x + 31 \\ -10x \quad -10x \\ \hline 11x - 13 = 31 \\ +13 \quad +13 \\ \hline 11x = 44 \\ \frac{11x}{11} = \frac{44}{11} \\ x = 4 \end{array}$$

$$UM = 21(4) - 13$$

$$= 84 - 13$$

$$= 71$$

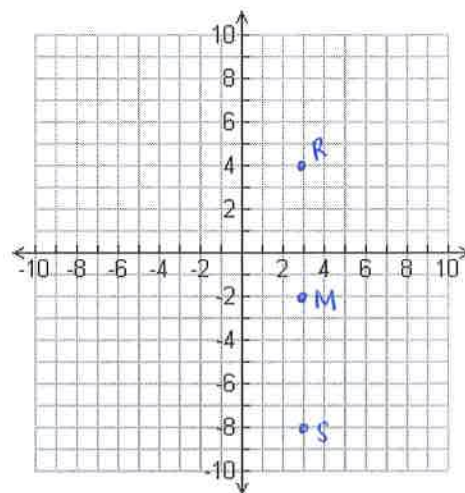
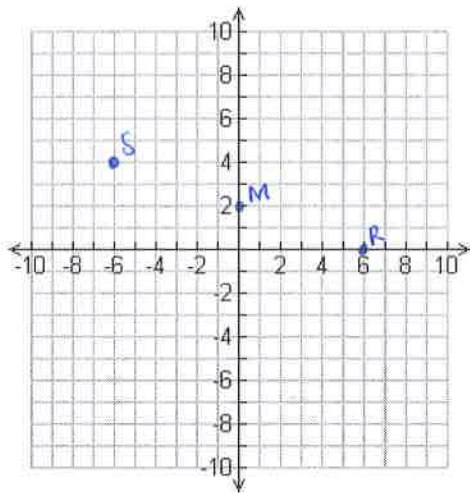
$$UV = 71 + 71$$

$$UV = 142$$

Use the given endpoint R and midpoint M of \overline{RS} to find the coordinates of the other endpoints.

18. R (6,0), M (0,2)

19. R (3,4), M (3,-2)



Pattern from R to M: Left 6, up 2

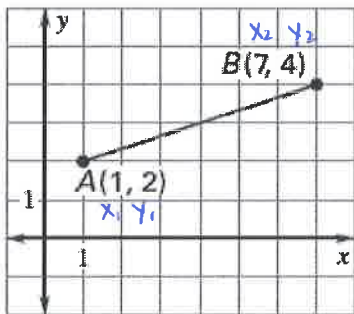
Pattern from R to M: Down 6

Repeat pattern from M to S: $S(-6, 4)$

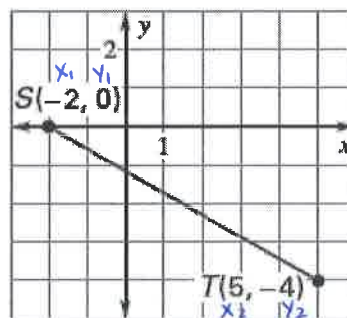
Repeat pattern from M to S: $S(3, -8)$

Find the length of the segment. Round to the nearest tenth of a unit. Distance = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

20.



21.



$$\begin{aligned} AB &= \sqrt{(7-1)^2 + (4-2)^2} \\ &= \sqrt{(6)^2 + (2)^2} \\ &= \sqrt{36+4} \\ &= \sqrt{40} \end{aligned}$$

$$AB \approx 6.3$$

$$\begin{aligned} ST &= \sqrt{(5-(-2))^2 + (-4-0)^2} \\ &= \sqrt{(5+2)^2 + (-4)^2} \\ &= \sqrt{(7)^2 + (-4)^2} \\ &= \sqrt{49+16} \\ &= \sqrt{65} \end{aligned}$$

$$ST \approx 8.1$$

The endpoints of two segments are given. Find each segment length. Tell whether the segments are congruent. Distance = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

22. \overline{AB} : $A(7, 2), B(0, -3)$
 \overline{CD} : $C(-4, 12), D(-1, 4)$

$$\begin{aligned} AB &= \sqrt{(0-7)^2 + (-3-2)^2} \\ &= \sqrt{(-7)^2 + (-5)^2} \\ &= \sqrt{49+25} \\ &= \sqrt{74} \end{aligned}$$

$AB \approx 8.6$

$$\begin{aligned} CD &= \sqrt{(-1-(-4))^2 + (4-12)^2} \\ &= \sqrt{(-1+4)^2 + (-8)^2} \\ &= \sqrt{(3)^2 + (-8)^2} \\ &= \sqrt{9+64} \\ &= \sqrt{73} \end{aligned}$$

$CD \approx 8.5$

$\overline{AB} \not\cong \overline{CD}$

23. \overline{RS} : $R(5, 6), S(11, -2)$
 \overline{TU} : $T(-7, 9), U(3, 9)$

$$\begin{aligned} RS &= \sqrt{(11-5)^2 + (-2-6)^2} \\ &= \sqrt{(6)^2 + (-8)^2} \\ &= \sqrt{36+64} \\ &= \sqrt{100} \end{aligned}$$

$RS = 10$

$$\begin{aligned} TU &= \sqrt{(3-(-7))^2 + (9-9)^2} \\ &= \sqrt{(3+7)^2 + (9-9)^2} \\ &= \sqrt{(10)^2 + (0)^2} \\ &= \sqrt{100+0} \\ &= \sqrt{100} \end{aligned}$$

$TU = 10$

$\overline{RS} \cong \overline{TU}$

Answer Key

1. $\overline{BU}, \overline{BH}, \overline{HB}, \overline{UH}, \overline{HU}$, line l ✓
2. Plane S, Plane BHE, Plane BEH, Plane HEB, etc. ✓
3. \overline{HU} ✓
4. Point B ✓
5. U, B, H ✓
6. Yes, they are congruent ✓
7. No, they are not congruent ✓
8. $x = 10, NP = 32$ ✓
9. $x = 5, NO = 27$ ✓
10. $HJ = 16, JK = 22$ ✓
11. $HJ = 57, JK = 3$ ✓
12. $(8, 1)$ ✓
13. $(2.5, 4)$ ✓
14. $(-5.5, -1)$ ✓
15. $(-11.5, -2.5)$ ✓
16. $x = 2, MQ = 7$ ✓
17. $x = 4, UV = 142$ ✓
18. $(-6, 4)$ ✓
19. $(3, -8)$ ✓
20. $AB \approx 6.3$ ✓
21. $ST \approx 8.1$ ✓
22. No, they are not congruent ✓
23. Yes, they are congruent ✓