Midpoints

title

4, 12, 6, 8

⑫ (-5,-4) (7,0)

$\sqrt{(-5-7)^2+(-4-0)^2}$

$\sqrt{(-12)^2+(-4)^2}$

$\sqrt{144+16}$

$\sqrt{160}$

$\sqrt{160}$
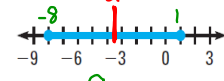
10 16

25 44

$4\sqrt{10}$

Aug 28-9:03 AM

Bisect—to divide into two congruent parts

Midpoint—the point that divides a segment into two
   congruent segments

Segment bisector—a line, ray, segment, or plane that
   intersects a segment at its midpoint

A —— M —— B

A —— M/C —— B
    D

Find the length of the blue segment.

Then find the coordinate of the
midpoint of the segment.

-3.5

-8   1

−9 −6 −3   0   3

9
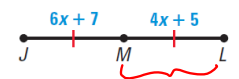
distance $|-8-1| = |-9|$

Midpt $\frac{-8+1}{2} = \frac{-7}{2} = -3.5$

midpoint

Find *LM*.
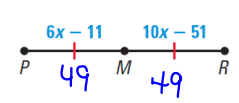
$6x+7 = 4x+5$
$-4x \quad -4x$
$2x+7 = 5$
$-7 \quad -7$
$2x = -2$
$x = -1$

$4(-1)+5$

$LM = 1$

6x + 7   4x + 5

J   M   L

Find *PR*.

$6x-11 = 10x-51$
$+51 \quad +51$
$6x+40 = 10x$
$-6x \quad -6x$
$40 = 4x$
$x = 10$

$PR = 98$

6x − 11   10x − 51

P   49   M   49   R

examples

Now lets look at the midpoint of a segment on a 2-dimensional graph.

F(5, −2) and *G*(−3, 4)   *E*(−6, 3) and *M*(−2, 1)

Find the midpoint *M*. $(1, 1)$ Find the other endpoint.

$\frac{4+2}{2}$

-2

-3

$\frac{-3+5}{2}$

G

S

F

examples

Midpoint Formula

The coordinates of the midpoint of a segment are the averages of the x-coordinates and the y-coordinates of the endpoints.

$(5, -3)$
$(2, 4)$

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

midpoint formula

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

A(−1, 7) and *B*(5, −3)   *C*(2, −4) and *D*(0, 5)

$M_x = \frac{-1+5}{2} = \frac{4}{2} = 2$

$M_y = \frac{7+-3}{2} = \frac{4}{2} = 2$

$(2, 2)$

examples

Find the coordinates of the other endpoint *D* of a segment with the given endpoint *E* and midpoint *M*.

E(−1, 6) and *M*(0, −2)   *E*(6, −4) and *M*(3, 2)

2. $0 = \frac{-1+x}{2} \cdot 2$ $\boxed{D(1, -10)}$ $M_x = \frac{x_1 + x_2}{2}$

$0 = -1 + x$

$\boxed{1 = x}$

2. $-2 = \frac{6+y}{2} \cdot 2$ $M_y = \frac{y_1 + y_2}{2}$

$-4 = 6 + y$ $y = -10$

examples

Conclusion

1. What is the midpoint formula?

2. Please describe how the midpoint formula works.

3. Do you have any questions?

Aug 22-12:52 PM

Assignment

Midpoint Worksheet

Aug 22-12:59 PM