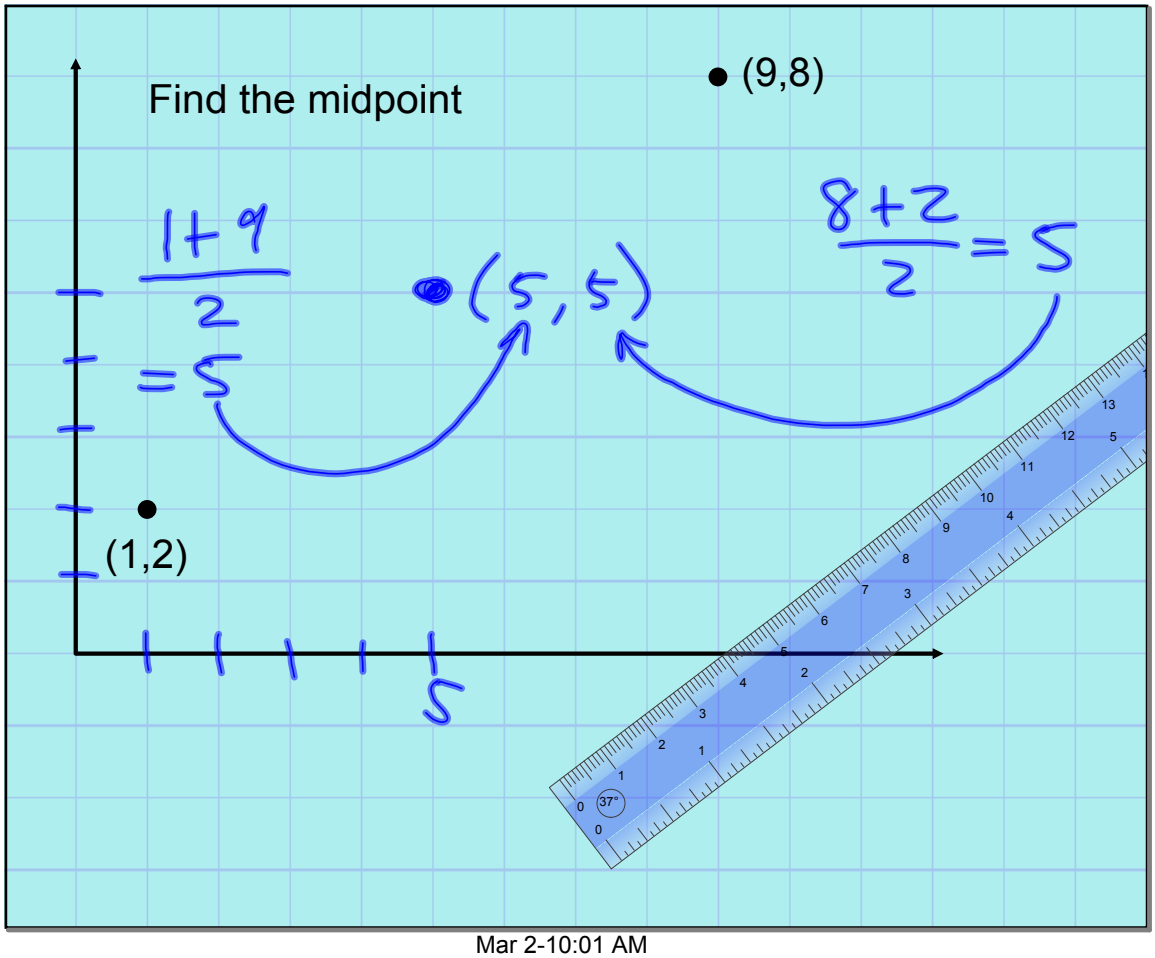
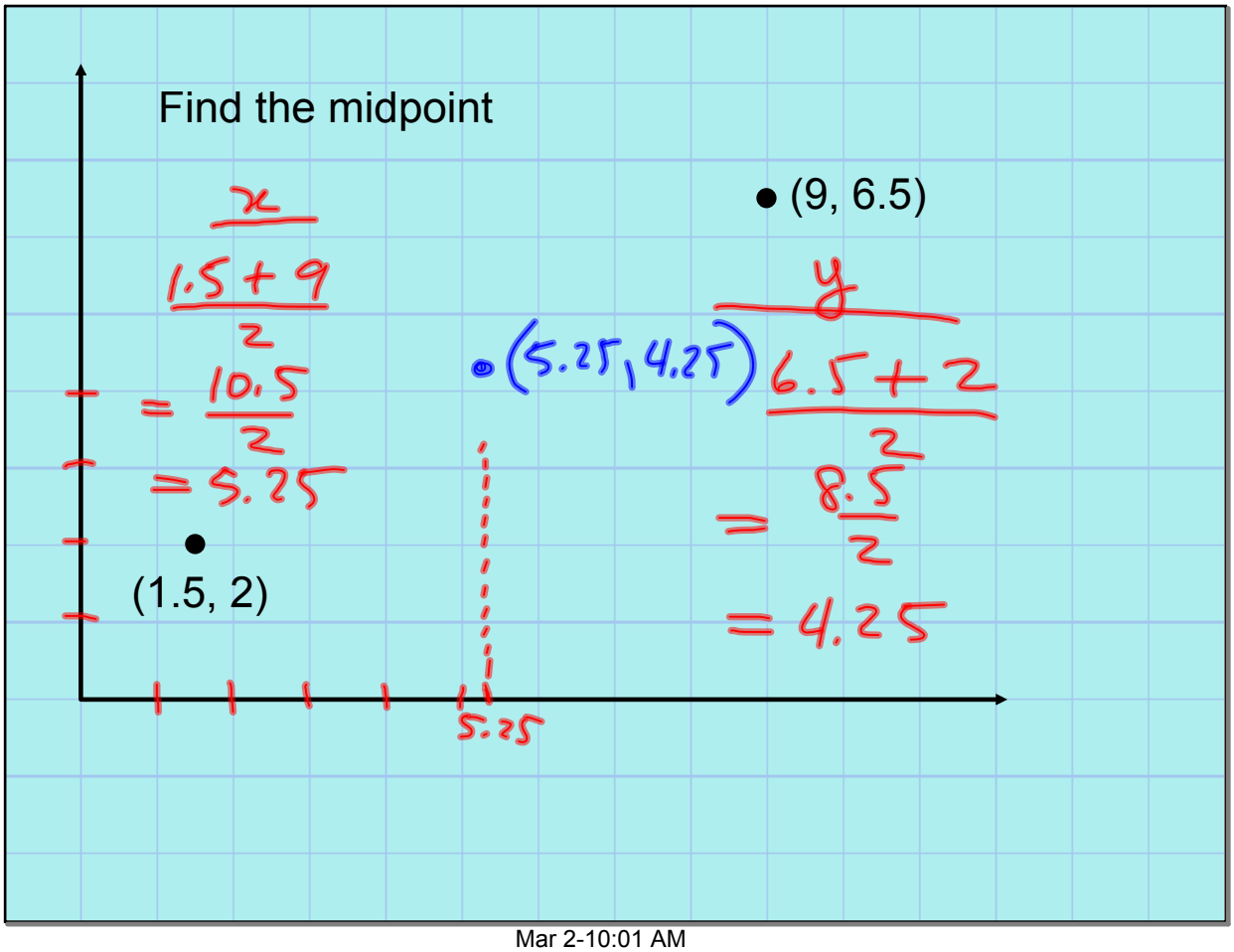


Mar 2-10:01 AM



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The Midpoint of a Line Segment

March 3/2010

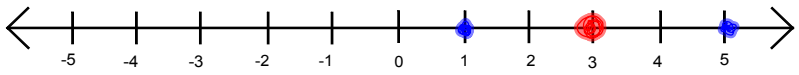
The midpoint of a line segment is the point halfway between the two endpoints.

Algebraically, we can consider the x-coordinates and y-coordinates separately, finding the halfway value for each.

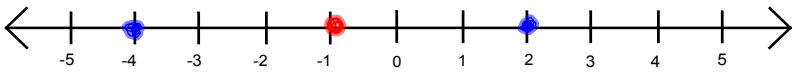
Ex.1. Determine the midpoint.

$\frac{1+5}{2} = \frac{6}{2} = 3$

a)



b)



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

Feb 28-11:11 AM

Algebraically, the halfway point between two values is their sum divided by two.

Given two points, (x_1, y_1) and (x_2, y_2), we can write

$$x_{midpoint} = \frac{x_1 + x_2}{2} \qquad y_{midpoint} = \frac{y_1 + y_2}{2}$$

In general, the midpoint formula is written

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

point in (x, y) representation

Mar 2-10:12 AM

Ex.2. Determine the coordinates of the Midpoint, M, of the line segment with endpoints A(-2, -3) and B(4, 7).

$x_m = \frac{x_1 + x_2}{2}$ $\quad y_m = \frac{y_1 + y_2}{2}$

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

$= \frac{2}{2}$ $\quad = \frac{4}{2}$

$= 1$ $\quad = 2$

$\therefore$ the midpoint is $(1, 2)$

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

$= M\left(\frac{-2+4}{2}, \frac{-3+7}{2}\right)$

$= M(1, 2)$

Mar 2-10:19 AM

Ex.3. One endpoint of a line segment is at (1,2) and has a midpoint of (5,5). What is the other endpoint?

$x_m = \frac{x_1 + x_2}{2}$ $\quad y_m = \frac{y_1 + y_2}{2}$

$5 = \frac{(1 + x_2)}{2}$ $\quad 5 = \frac{2 + y_2}{2}$

$1 + x_2 = 10$ $\quad 2 + y_2 = 10$

$x_2 = 9$ $\quad y_2 = 8$

$\therefore$ the other endpoint is $(9, 8)$

Mar 2-8:32 PM

Assigned Work:

p. 173 # 1, 2achi, 3, 4, 5, 11

Quiz on Friday, March 5, 2010

- length of a line segment
- equation of a circle
- midpoint of a line segment

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