September 1, 2010

Note Title 9/1/2010

midpoints:

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

$(x_1, y_1) = (2, 6)$

$(x_2, y_2) = (-4, -2)$

$$(x_m, y_m) = \left(\frac{2 + (-4)}{2}, \frac{6 + (-2)}{2}\right) = \left(\frac{-2}{2}, \frac{4}{2}\right)$$

$$= (-1, 2)$$

Example.

$$(x_1, y_1) = \left(\frac{7}{5}, \frac{1}{9}\right), \quad (x_2, y_2) = \left(\frac{1}{2}, -\frac{7}{3}\right)$$

midpoint of line segment.

$$x_m = \frac{x_1 + x_2}{2} = \frac{\frac{7}{5} + \frac{1}{2}}{2} = \frac{1}{2}\left(\frac{7}{5} + \frac{1}{2}\right)$$

$$= \frac{1}{2}\left(\frac{14}{10} + \frac{5}{10}\right)$$

$$= \frac{1}{2}\left(\frac{19}{10}\right) = \frac{19}{20}$$

$$y_m = \frac{y_1 + y_2}{2} = \frac{1}{2}\left(\frac{1}{9} + \left(\frac{-7}{3}\right)\right)$$

$$= \frac{1}{2}\left(\frac{1}{9} - \frac{21}{9}\right)$$

$$= \frac{1}{2}\left(-\frac{20}{9}\right)$$

$$= -\frac{10}{9}$$

mid point $(x_m, y_m) = \left(\frac{19}{20}, -\frac{10}{9}\right)$

Example

$$(x_1, y_1) = (3\sqrt{5}, -3\sqrt{3})$$

$$(x_2, y_2) = (-\sqrt{5}, -\sqrt{3})$$

$$x_m = \frac{x_1 + x_2}{2} = \frac{3\sqrt{5} + (-\sqrt{5})}{2}$$

$$= \frac{3\sqrt{5} - \sqrt{5}}{2}$$

$$= \frac{2\sqrt{5}}{2}$$

$$= \sqrt{5}$$

$$y_m = \frac{y_1 + y_2}{2} = \frac{-3\sqrt{3} + (-\sqrt{3})}{2}$$

$$= \frac{-3\sqrt{3} - \sqrt{3}}{2}$$

$$= -\frac{4\sqrt{3}}{2}$$

$$= -2\sqrt{3}$$

midpoint $(x_m, y_m) = (\sqrt{5}, -2\sqrt{3})$.

Homework §2.1 # 12, 14, 22