LESSON 1-1

ment Length and Midpoints A & B

Determine the coordinates of the midpoint for each segment. Identify the quadrant that each midpoint lies in.

1. $\overline{PQ}$ has endpoints $P(5, -3)$ and $Q(2, 4)$.

$\frac{5+2}{2} = \frac{7}{2}$ $\quad \frac{-3+4}{2} = \frac{1}{2}$

Midpoint: $\left(\frac{7}{2}, \frac{1}{2}\right)$ or $(3.5, .5)$

Quadrant: I

2. $\overline{RS}$ has endpoints $R(-2, 3)$ and $S(-8, -2)$.

Midpoint: $\left(-5, \frac{1}{2}\right)$ or $(-5, .5)$ $\quad \frac{-2+(-8)}{2} = \frac{-10}{2} = -5$ $\quad \frac{3+(-2)}{2} = \frac{1}{2}$

Quadrant: II

3. $(3, -5)$, $(0, 10)$

$\frac{3+0}{2} = \frac{3}{2}$ $\quad \frac{-5+10}{2} = \frac{5}{2}$

Midpoint: $\left(\frac{3}{2}, \frac{5}{2}\right)$ or $(1.5, 2.5)$

Quadrant: I

4. $(3, -5), (-9, -8)$

Midpoint: $\left(-3, \frac{-13}{2}\right)$ or $(-3, -6.5)$ $\quad \frac{3+(-9)}{2} = \frac{-6}{2} = -3$ $\quad \frac{-5+(-8)}{2} = \frac{-13}{2}$

Quadrant: III

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

7) $(-7, 5)$, $(-10, 10)$

$\frac{-7+(-10)}{2} = \frac{-17}{2}$ $\quad \frac{5+10}{2} = \frac{15}{2}$

$\left(-\frac{17}{2}, \frac{15}{2}\right)$ or $(-8.5, 7.5)$

8) $(10, 1)$, $(-2, 8)$

$\frac{10+(-2)}{2} = \frac{8}{2} = 4$ $\quad \frac{1+8}{2} = \frac{9}{2}$

$\left(4, \frac{9}{2}\right)$ or $(4, 4.5)$

9) $(-3, -10)$, $(-8, 7)$

$\frac{-3+(-8)}{2} = \frac{-11}{2}$ $\quad \frac{-10+7}{2} = \frac{-3}{2}$

$\left(\frac{-11}{2}, \frac{-3}{2}\right)$ or $(-5.5, -1.5)$

10) $(1, 0)$, $(-5, 2)$

$\frac{1+(-5)}{2} = \frac{-4}{2} = -2$ $\quad \frac{0+2}{2} = \frac{2}{2} = 1$

$(-2, 1)$

Challenge Problem:

29. Critical Thinking Point M is the midpoint of $\overline{AB}$. The coordinates of point A are $(-8, 3)$ and the coordinates of M are $(-2, 1)$. What are the coordinates of point B?