Midpoint Formula Notes

The **Midpoint Formula** allows you to find the **midpoint** or **center** between two points. $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$ (1, 2) (3, 4) $x_1\ y_1$ $x_2\ y_2$

1. Find the midpoint between (1, -2) and (-3, 6). $(-1, 2)$

$x_1\ y_1$ $x_2\ y_2$

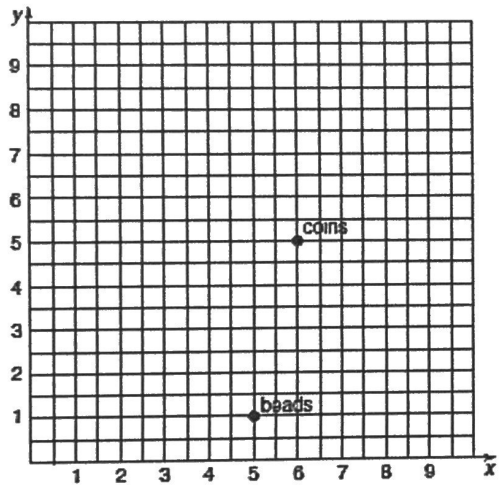
$\left(\frac{1+(-3)}{2}, \frac{-2+6}{2}\right) = \left(\frac{-2}{2}, \frac{4}{2}\right)$

2. Find the midpoint between (6, 3) and (-6, 4).

$x_1\ y_1$ $x_2\ y_2$

$\left(\frac{6+(-6)}{2}, \frac{3+4}{2}\right) = \left(\frac{0}{2}, \frac{7}{2}\right) = \left(0, \frac{7}{2}\right)$ or $(0, 3.5)$

3. How would you find the midpoint between the coins and beads?



Coins are located at $\underset{x_1\ y_1}{(6, 5)}$

Beads are located at $\underset{x_2\ y_2}{(5, 1)}$

Midpoint _____

$\left(\frac{6+5}{2}, \frac{5+1}{2}\right)$

$\left(\frac{11}{2}, \frac{6}{2}\right) = \left(\frac{11}{2}, 3\right)$

$(5.5, 3)$

$x_1\ y_1$ x_m, y_m

4. **M is the midpoint** of segment AB. The coordinates of A are (-2, 3) and the coordinates of M are (1, 0). Find the coordinates of B.

$X_m = \frac{X_1 + X_2}{2}$ A (x_1, y_1) M (x_m, y_m) B (x_2, y_2)

$2 \cdot 1 = \frac{-2 + x_2}{2} \cdot 2$

$2 = -2 + x_2$

$+2 \quad +2$

$4 = x_2$

$\underset{x_2\ y_2}{(4, -3)}$

$Y_m = \frac{Y_1 + Y_2}{2}$ $2 \cdot 0 = \frac{3 + y_2}{2} \cdot 2$

$0 = 3 + y_2$

$-3 \quad -3$

$y_2 = -3$

5. **B is the midpoint** of segment AC. The coordinates of A are (-10, 4) and the coordinates of B are (-2,4). Find the coordinates of C.

$x_1\ y_1$ x_m, y_m

A (x_1, y_1) B (x_m, y_m) C (x_2, y_2)

$\underset{x_2\ y_2}{(6, 4)}$

$X_m = \frac{X_1 + X_2}{2}$

$2 \cdot -2 = \frac{-10 + x_2}{2} \cdot 2$

$-4 = -10 + x_2$

$+10 \quad +10$

$6 = x_2$

$y_m = \frac{y_1 + y_2}{2}$

$2 \cdot 4 = \frac{4 + y_2}{2} \cdot 2$

$8 = 4 + y_2$

$-4 \quad -4$

$y^2 = 4$