Perpendicular Bisector Equations

To write the equation of the perpendicular bisector, you need the perpendicular slope and the midpoint (bisector).

Example: Given the points $A(2,5)$ and $B(-4,3)$, find the equation of the perpendicular bisector of $\overline{AB}$.

Solution: Find the slope first: $\frac{3-5}{-4-2}=\frac{-2}{-6}=\frac{1}{3}$. We want the perpendicular slope, which is -3

Then we need to find the midpoint so it bisects $\overline{AB}$: $\left(\frac{2+(-4)}{2}, \frac{5+3}{2}\right)=(-1, 4)$.

Using the slope of -3 and the point $(-1, 4)$ write the equation of the perpendicular bisector in both slope-intercept form and standard form:

$$\frac{y-4}{x+1}=\frac{-3}{1}$$

$y-4=-3x-3$ (add 4 to both sides)

$y=-3x+1$ (slope-intercept form)

or (add 3x to both sides)

$3x+y=1$ (standard form)

Find the perpendicular bisector of $\overline{AB}$ for each problem. Write your answer in both slope-intercept from and standard form.

1. $A(-3,8)$ and $B(5, 10)$

2. $A(4,1)$ and $B(-4, 7)$

3. $A(3,4)$ and $B(4, 5)$

4. $A(9,3)$ and $B(-7, 5)$

5. $A(2,4)$ and $B(2, 2)$

6. $A(2,4)$ and $B(3, 5)$