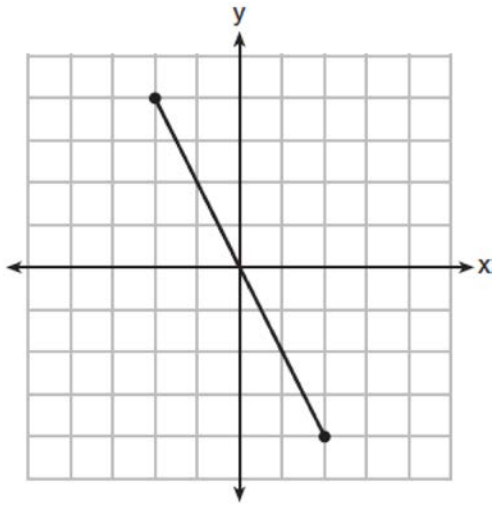
Name: _____

G.GPE.B.5: Parallel and Perpendicular Lines 8

1 What is an equation of the perpendicular bisector of the line segment shown in the diagram below?



1) $y + 2x = 0$
2) $y - 2x = 0$
3) $2y + x = 0$
4) $2y - x = 0$

2 The coordinates of the endpoints of $\overline{AB}$ are $A(0,0)$ and $B(0,6)$. The equation of the perpendicular bisector of $\overline{AB}$ is

1) $x = 0$
2) $x = 3$
3) $y = 0$
4) $y = 3$

3 Which equation represents the perpendicular bisector of $\overline{AB}$ whose endpoints are $A(8,2)$ and $B(0,6)$?

1) $y = 2x - 4$
2) $y = -\frac{1}{2}x + 2$
3) $y = -\frac{1}{2}x + 6$
4) $y = 2x - 12$

4 Triangle ABC has vertices $A(0,0)$, $B(6,8)$, and $C(8,4)$. Which equation represents the perpendicular bisector of $\overline{BC}$?

1) $y = 2x - 6$
2) $y = -2x + 4$
3) $y = \frac{1}{2}x + \frac{5}{2}$
4) $y = -\frac{1}{2}x + \frac{19}{2}$

5 Line segment NY has endpoints $N(-11,5)$ and $Y(5,-7)$. What is the equation of the perpendicular bisector of $\overline{NY}$?

1) $y + 1 = \frac{4}{3}(x + 3)$
2) $y + 1 = -\frac{3}{4}(x + 3)$
3) $y - 6 = \frac{4}{3}(x - 8)$
4) $y - 6 = -\frac{3}{4}(x - 8)$

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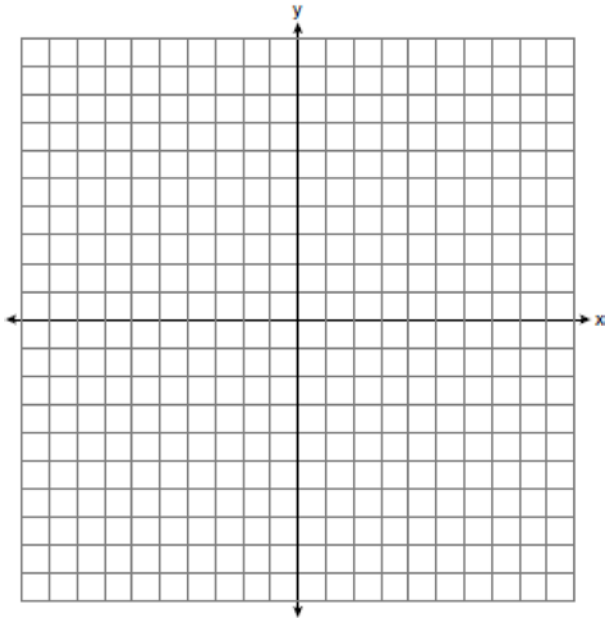
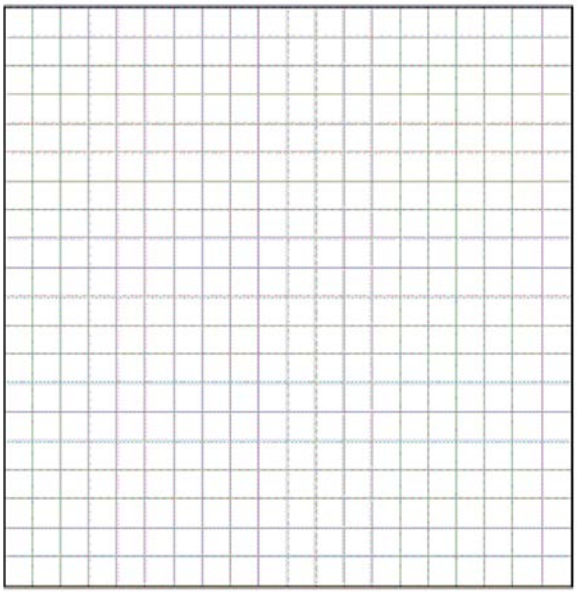
6 If $\overline{AB}$ is defined by the endpoints $A(4,2)$ and $B(8,6)$, write an equation of the line that is the perpendicular bisector of $\overline{AB}$.

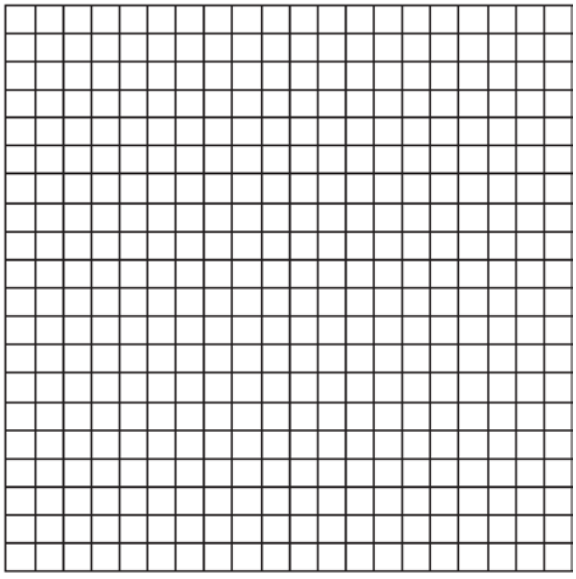
7 Write an equation of the line that is the perpendicular bisector of the line segment having endpoints $(3,-1)$ and $(3,5)$. [The use of the grid below is optional]



8 Write an equation of the perpendicular bisector of the line segment whose endpoints are $(-1,1)$ and $(7,-5)$. [The use of the grid below is optional]



9 Determine the distance between point $A(-1,-3)$ and point $B(5,5)$. Write an equation of the perpendicular bisector of $\overline{AB}$. [The use of the accompanying grid is optional.]



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Answer Section

1 ANS: 4

The segment's midpoint is the origin and slope is –2. The slope of a perpendicular line is $\frac{1}{2}$. $y = \frac{1}{2}x + 0$

$2y = x$

$2y - x = 0$

REF: 081724geo

2 ANS: 4

$\overline{AB}$ is a vertical line, so its perpendicular bisector is a horizontal line through the midpoint of $\overline{AB}$, which is $(0,3)$.

REF: 011225ge

3 ANS: 1

$m = \left(\frac{8+0}{2}, \frac{2+6}{2}\right) = (4,4)$ $m = \frac{6-2}{0-8} = \frac{4}{-8} = -\frac{1}{2}$ $m_{\perp} = 2$ $y = mx + b$

$4 = 2(4) + b$

$-4 = b$

REF: 081126ge

4 ANS: 3

midpoint: $\left(\frac{6+8}{2}, \frac{8+4}{2}\right) = (7,6)$. slope: $\frac{8-4}{6-8} = \frac{4}{-2} = -2$; $m_{\perp} = \frac{1}{2}$. $6 = \frac{1}{2}(7) + b$

$\frac{12}{2} = \frac{7}{2} + b$

$\frac{5}{12} = b$

REF: 081327ge

5 ANS: 1

$m = \left(\frac{-11+5}{2}, \frac{5+-7}{2}\right) = (-3,-1)$ $m = \frac{5--7}{-11-5} = \frac{12}{-16} = -\frac{3}{4}$ $m_{\perp} = \frac{4}{3}$

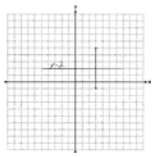
REF: 061612geo

6 ANS:

$M = \left(\frac{4+8}{2}, \frac{2+6}{2}\right) = (6,4)$ $m = \frac{6-2}{8-4} = \frac{4}{4} = 1$ $m_{\perp} = -1$ $y - 4 = -(x - 6)$

REF: 081536ge

7 ANS:

$M = \left(\frac{3+3}{2}, \frac{-1+5}{2}\right) = (3,2).\ y = 2.$ 

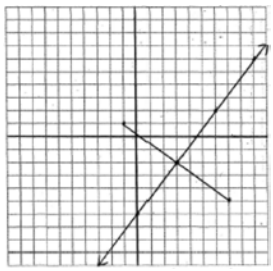
REF: 011334ge

8 ANS:

$y = \frac{4}{3}x - 6.$ $M_x = \frac{-1+7}{2} = 3$ The perpendicular bisector goes through $(3,-2)$ and has a slope of $\frac{4}{3}$.

$M_y = \frac{1+(-5)}{2} = -2$

$m = \frac{1-(-5)}{-1-7} = -\frac{3}{4}$



$y - y_M = m(x - x_M).$

$y + 2 = \frac{4}{3}(x - 3)$

REF: 080935ge

9 ANS:

$$d = \sqrt{(-1-5)^2 + (-3-5)^2}$$

$$= \sqrt{100}$$

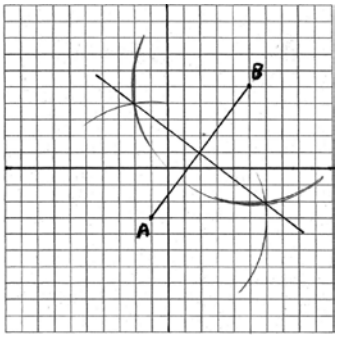
$$= 10$$

$$M_x = \frac{-1+5}{2} = 2$$

$$M_y = \frac{-3+5}{2} = 1$$

$$m = \frac{-3-5}{-1-5} = \frac{-8}{-6} = \frac{4}{3}$$

10, $y - 1 = -\frac{3}{4}(x-2)$. . To find the equation of the perpendicular bisector, calculate midpoint and slope. . The perpendicular bisector of $\overline{AB}$ goes through (2,1) and has a slope of $-\frac{3}{4}$.



$$y - y_M = m(x - x_M)$$

$$y - 1 = -\frac{3}{4}(x-2)$$

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REF: 080235a