

Coordinate Geometry – REVIEW

1. What is the slope of the line that passes through the points (2, 3) and (-1, 12)?

$$m = \frac{12-3}{-1-2} = \frac{9}{-3} = -3$$

2. What is the length of \overline{AB} if the coordinates of the endpoints are A(2, 3) and B(-1, 12)? (simplest radical form)

$$\begin{aligned} & (2 - (-1))^2 + (3 - 12)^2 && \sqrt{90} && 3\sqrt{10} \\ & 3^2 + 9^2 && \sqrt{9}\sqrt{10} && \\ & 9 + 81 && && \end{aligned}$$

3. If A and B are the endpoints of the diameter of a circle, and the coordinates of the points are A(-5, -1) and B(3, 7), find the center of the circle.

$$\left(\frac{-5+3}{2}, \frac{-1+7}{2} \right) = \left(\frac{-2}{2}, \frac{6}{2} \right) = (-1, 3)$$

4. Write an equation of the line that satisfies the given conditions:

- a. Parallel to $y = -5x + 1$, with y-intercept of 3.
- b. Perpendicular to $3x + 2y = -7$ and passing thru the point (-6, 5).
- c. Goes through the points (2, 4) and (5, -1).
- d. Has a slope of 4 and an x-intercept of -2. x-intercept $\rightarrow y=0$
- e. Goes through the points (4, 3) and (4, -2)
- f. Perpendicular to the line that goes through the points (-2, 8) and (-2, 2), and has a y-intercept of -4

a) $y = -5x + 3$

b) $3x + 2y = -7$
 $2y = -3x - 7$
 $y = \frac{-3}{2}x - \frac{7}{2}$

$m = \frac{-3}{2}$
 $\perp m = \frac{2}{3}$

$y - 5 = \frac{2}{3}(x - (-6))$
 $y - 5 = \frac{2}{3}x + 4$
 $y = \frac{2}{3}x + 9$

c) $\frac{-1-4}{5-2} = \frac{-5}{3}$

$y - 4 = \frac{-5}{3}(x - 2)$

$y - 4 = \frac{-5}{3}x + \frac{10}{3}$

$y = \frac{-5}{3}x + \frac{22}{3}$

$y = 4x + 8$

d) $0 = 4(-2) + b$
 $0 = -8 + b$
 $b = 8$

e) $\frac{-2-3}{4-4} = \frac{-5}{0} = \text{No}$

$x = 4$

f) $m = \frac{2-8}{-2-(-2)} = \frac{-6}{0} = \text{No}$

$\perp m = \text{Zero}$

$y = -4$

5. Write the equation for the perpendicular bisectors of the line segments connecting each pair of points:

a. C(3, -1), A(7, 3)

b. C(3, -1), T(1, 3)

c. T(1, 3), A(7, 3)

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

$$c) \frac{3 - 3}{7 - 1} = \frac{0}{6} = \text{zero}$$

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

$$\left(\frac{3+7}{2}, \frac{-1+3}{2}\right) = (5, 1)$$

$$Y - 1 = -1(X - 5)$$

$$Y - 1 = -X + 5$$

$$\boxed{Y = -X + 6}$$

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

$$Y - 1 = \frac{1}{2}(X - 2)$$

$$Y - 1 = \frac{1}{2}X - 1$$

$$\boxed{Y = \frac{1}{2}X}$$

$$\left(\frac{1+7}{2}, \frac{3+3}{2}\right) = (4, 3)$$

$\perp m = \text{No slope}$

$$\boxed{X = 4}$$

6. Two perpendicular lines intersect at (2, -1). If $x - y = 3$ is the equation of one of these lines, what is the equation of the other?

$$X - Y = 3$$

$$\frac{-Y}{-1} = \frac{-X + 3}{-1}$$

$$Y = X - 3$$

$$\perp m = -1$$

$$Y - (-1) = -1(X - 2)$$

$$Y + 1 = -X + 2$$

$$\boxed{Y = -X + 1}$$

7. Given the sets of points in each part, determine whether the lines through these points are parallel, perpendicular, or neither.

a. (2, 0), (0, 4) and (-1, 3), (-1, 5)

b. (-4, -5), (6, 0) and (5, 1), (4, 3)

c. (-5, 2), (7, 0) and (-6, -2), (4, -4)

$$b) \frac{0 - (-5)}{6 - (-4)} = \frac{5}{10} = \frac{1}{2}$$

$$\frac{3 - 1}{4 - 5} = \frac{2}{-1} \quad \text{⊥}$$

$$a) \frac{4 - 0}{0 - 2} = \frac{4}{-2} = -2$$

$$\frac{5 - 3}{-1 - (-1)} = \frac{2}{0}$$

Neither

$$c) \frac{0 - 2}{7 - (-5)} = \frac{-2}{12} = \frac{-1}{6}$$

$$\frac{-4 - (-2)}{4 - (-6)} = \frac{-2}{10} = \frac{-1}{5}$$

Neither