

Tuesday, 6/06/06

**Notes #25: Parallel and Perpendicular Lines
Midpoint (Sections 13.3, 13.5)**

Parallel Lines have _____ slopes. Ex:

Perpendicular Lines have _____, _____ slopes. Ex:

The slope of a line is given. Find the slope of a line parallel to it and the slope of a line perpendicular to it:

1.) $m = -\frac{2}{3}$

2.) $m = 7$

3.) $m = 0$

Are the lines with these slopes parallel, perpendicular, or neither?

4.) $\frac{2}{3}, \frac{4}{6}$

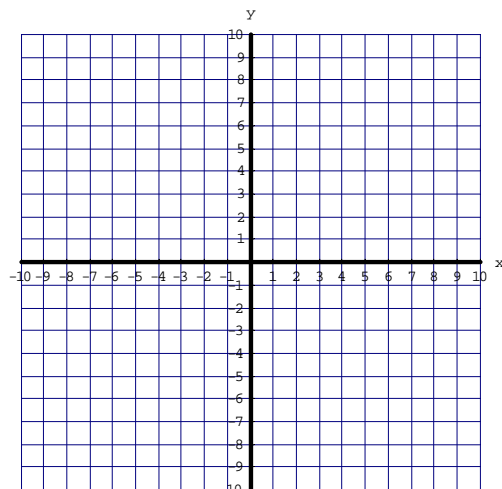
5.) $-4, 4$

6.) $-1, 1$

7.) Find the slope of a line parallel and perpendicular to AB where A(-3, 1) and B (2, 4)
(parallel) (perpendicular)

Graph the two points and find the midpoint of \overline{AB} .

8.) A (2, 8) B (-4, 0)



Midpoint Formula

The midpoint of a segment connecting two points, (x_1, y_1) and (x_2, y_2) is:

$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

(average the x's, average the y's)

Use the midpoint formula to find the midpoint of the segment with the given endpoints.

(Hint: first label your points as (x_1, y_1) and (x_2, y_2))

9.) $(0, 2)$ and $(6, 4)$

10.) $(-2, 6)$ and $(4, 3)$

11.) $(a, 3)$ and $(3a + 2, -1)$

12.) Find the equation of the circle whose diameter has endpoints of $(-2, -4)$ and $(4, 4)$

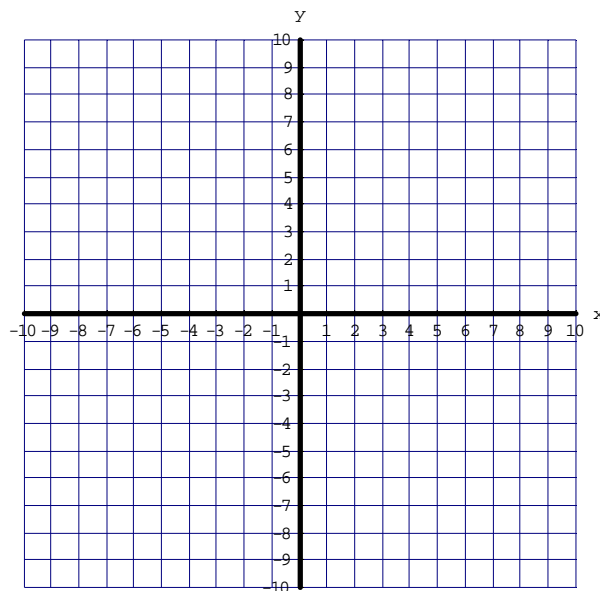
(Hint: The center of the circle is the midpoint of the diameter.)

M is the midpoint of AB. Find the coordinates of B. [Call B(x, y) and write two equations.]

13.) A $(-2, 5)$ M $(3, 1)$

14.) A $(0, -4)$ M $(-3, -3)$

15.) A circle has a center (1, 3) and passes through the point (4, -1). Find the equation of this circle and graph it. [As usual, make the center (h, k). Call the point (x, y) to plug in and solve for r.]



Exponent Rules:

$x^0 = \underline{\hspace{2cm}}$, $5^0 = \underline{\hspace{2cm}}$

$x^2 \cdot x^3 = \underline{\hspace{2cm}}$, $2^4 \cdot 2^3 \cdot 2^2 = \underline{\hspace{2cm}}$

$(x^2)^3 = \underline{\hspace{2cm}}$, $(3^4)^5 = \underline{\hspace{2cm}}$

$x^{-2} = \underline{\hspace{2cm}}$, $4^{-3} = \underline{\hspace{2cm}}$

$\frac{x^6}{x^2} = \underline{\hspace{2cm}}$, $\frac{5^7}{5^3} = \underline{\hspace{2cm}}$

Simplify: (Leave answers in positive exponents)

1.) $(-2)^3$

2.) $(-3)^{-2}$

3.) $\left(\frac{3}{2}\right)^{-3}$

4.) $2^3 \cdot 2^{-2} \cdot 2^5$

5.) $x^{-5} \cdot x \cdot x^2$