

Jan 30

- Review → Distance Formula, midpoint formula  
 ↳ know how to solve for any component using these formulae, given whatever information you'll have!

- know → Quadrants!

$(-x, y)$	$(x, y)$
II	I
$(-x, -y)$	$(x, -y)$
III	IV

- know → circles; standard and general form

$$(x-h)^2 + (y-k)^2 = r^2 \quad \text{or} \quad ax^2 + by^2 + cx + dy + e = 0$$

★ About the test  
 (Show work!)

- know → Lines; given points, slopes, pictures, equations of lines. All about lines!

END

★  $y = mx + b$  → slope-intercept

★  $y - y_1 = m(x - x_1)$  → point-slope

→ parallel, perpendicular, horizontal, vertical

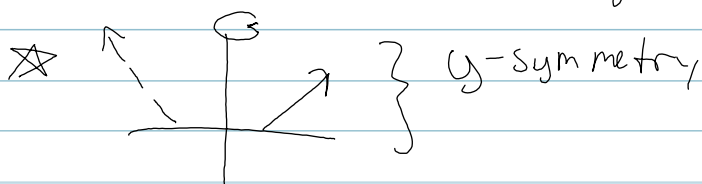
- know → Variation: { Inverse, standard, etc }

- know → Symmetry!

↳ Given  $(-2, 5)$  find origin symmetry.  
 $(x, y) \rightarrow (-x, -y) \Rightarrow (-2, 5) \rightarrow (2, -5)$

↳ x-axis →  $(x, y) \Rightarrow (x, -y)$

↳ y-axis →  $(x, y) \Rightarrow (-x, y)$



• Know → Symmetry given equations!

$$\hookrightarrow y = x^2 + 2$$

Δ x-symmetry?  $\Rightarrow (-y) = x^2 + 2 \Rightarrow$  NOT x symmetrical

Δ y-symmetry:  $\Rightarrow y = (-x)^2 + 2 \Rightarrow y = x^2 + 2 \Rightarrow$  y-symmetry

Δ Origin:  $\Rightarrow (-y) = (x)^2 + 2 \Rightarrow$  No origin symmetry  
 $-y = x^2 + 2$

$$\star y = \frac{-x}{x^2+3} \quad \left\{ \begin{array}{l} \frac{-(-x)}{(-x)^2+3} = \frac{x}{x^2+3} \Rightarrow \text{NOT y symmetry} \\ \rightarrow -y = \frac{-x}{x^2+3} \Rightarrow y = \frac{x}{x^2+3} \Rightarrow \text{NOT x symmetry} \\ \rightarrow -y = \frac{-(-x)}{(-x)^2+3} \Rightarrow -y = \frac{x}{x^2+3} \Rightarrow y = \frac{-x}{x^2+3} \end{array} \right.$$

★ Symmetry about the origin!

### Some Questions

#31  $\frac{2x^2 + 2y^2 - 12x + 4y - 24}{2} = 0$  ; find center, radius, graph, and find intercepts.

$$\Delta x^2 + y^2 - 6x + 2y - 12 = 0$$

$$\Delta x^2 - 6x + 9 + (y^2 + 4y) + 4 = 12 + 4 + 4$$

$$\Rightarrow (x-3)^2 + (y+2)^2 = 20$$

$$\Delta (x-3)^2 + (y+2)^2 = 25 \quad \sqrt{25} = 5$$

↳ Center: (3, -2), r = 5

x-intercepts  $\Rightarrow$   $y=0$

$$(x-3)^2 + (0+2)^2 = 25$$

$$(x-3)^2 + (2)^2 = 25$$

$$(x-3)^2 = 21$$

$$x-3 = \pm\sqrt{21}$$

$$\boxed{x = 3 \pm \sqrt{21}} \Rightarrow (7.6, 0), (\underline{\underline{-1.6}}, 0)$$

y-intercepts  $\Rightarrow$   $x=0$

$$(0-3)^2 + (y+2)^2 = 25$$

$$9 + (y+2)^2 = 25$$

$$(y+2)^2 = 16$$

$$y+2 = \pm 4$$

$$y = 2, y = -6 \Rightarrow (0, 2), (0, -6)$$

\* Equation of a line through  $(-1, 5)$ , perpendicular to

① Answer in slope-intercept form  $4x - 3y = 12$ .

↳ Slope ~~is~~ & point  $\Rightarrow 4x - 3y = 12$

$$4x - 12 = 3y$$

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

$$\Rightarrow \boxed{m = -\frac{3}{4}}$$

$$\rightarrow \frac{3}{4} = \frac{y-5}{x-(-1)}$$

$$\left\{ \begin{array}{l} \frac{-3}{4} \cdot \frac{y-5}{x+1} \Rightarrow -3(x+1) = 4(y-5) \\ -3x-3 = 4y-20 \\ -3x+17 = 4y \end{array} \right.$$

$$\boxed{-\frac{3}{4}x + \frac{17}{4} = y}$$

#20 on review

k.w.: LINEAR, C & F,  $10^\circ \rightarrow 50^\circ F$ ,  $30^\circ C \rightarrow 86^\circ F$

point and slope

$(10, 50)$

$(30, 86)$

$$\text{Slope: } \frac{86 - 50}{30 - 10} = \frac{36}{20} = \frac{9}{5} \begin{matrix} \nearrow F \\ \rightarrow C \end{matrix}$$

$$m = \frac{y - y_1}{x - x_1} \Rightarrow m = \frac{F - F_1}{C - C_1}; (10, 50)$$

$$\begin{aligned} \rightarrow \frac{9}{5} &= \frac{F - 50}{C - 10} \Rightarrow 9C - 90 = 5F - 250 \\ & 9C = 5F - 160 \\ & \boxed{C = \frac{5}{9}F - \frac{160}{9}} \end{aligned}$$

"Find C"  
When given  $\Rightarrow$  solve for F "

$$\star C = \frac{5}{9}(24) - \frac{160}{9} \approx \boxed{-1.67^\circ\text{C}}$$

below freezing  
makes sense!