Name:_____ Period:_____

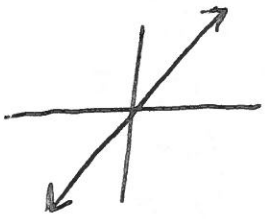
1.1 Graphs of Equations

Sketch a graph and find an equation that fits the following conditions.

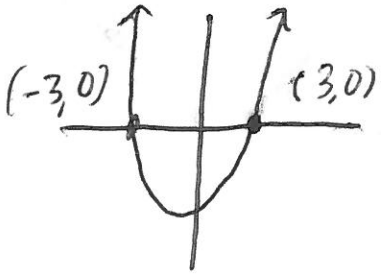
1. Linear equation symmetric over the origin.

Any linear equation with y int = 0.

EX: $y = 2x$



2. Quadratic equation symmetric over y-axis with an x-intercept of (3, 0).

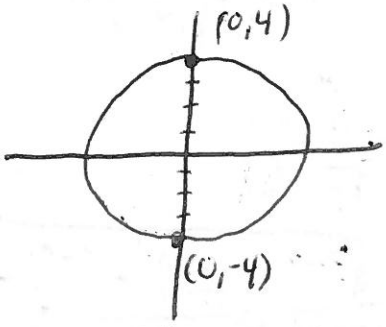


$y = a(x-3)(x+3)$

↑

a can be any real number.

3. Symmetric over x-axis, y-axis & origin and has y-intercepts of (0, 4) and (0, -4).



$(x-0)^2 + (y-0)^2 = 4^2$

$x^2 + y^2 = 16$

Identify the intercepts, symmetry for each equation and use that to sketch a graph.

5. $y = -x^2 - x + 6$

$= -(x^2 + x - 6)$

X int

$0 = -x^2 - x + 6$

$0 = -1(x + x - 6)$ (-3,0)

$0 = -1(x+3)(x-2)$ (2,0)

y int

$y = -0^2 - 0 + 6$

$y = 6$

(0,6)

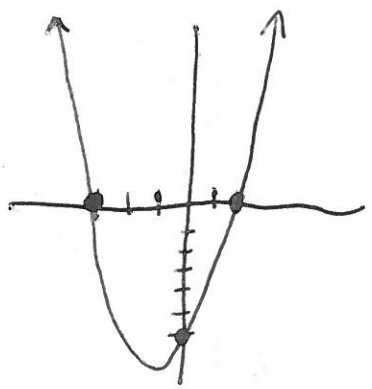
symmetry

$y = -(-x)^2 - (-x) + 6$

$-x^2 + x + 6$

Not opposite or equal to

$y = -x^2 - x + 6$

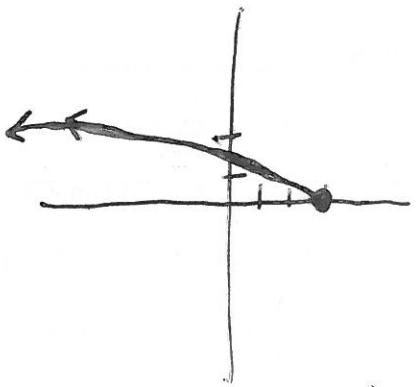


6. $y=\sqrt{3-x}$

X int: $0=\sqrt{3-x}$, $0=3-x$, $x=3$, $(3,0)$

y int: $y=\sqrt{3-0}$, $=\sqrt{3}$, $(0,\sqrt{3})$

Symmetry: $y=\sqrt{3-(-x)}$, $y=\sqrt{3+x}$, No symmetry.



7. $y=|x|-3$

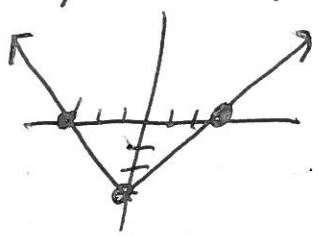
X int: $0=|x|-3$, $3=|x|$, $x=3$ or -3, $(3,0)$ $(-3,0)$

y int: $y=|0|-3$, $y=-3$, $(0,-3)$

Symmetry: $y=|x|-3$ ✓, $=|-x|-3$ ✓, $|x|-3$ ✓

(x,y) & $(-x,y)$

y axis sym.

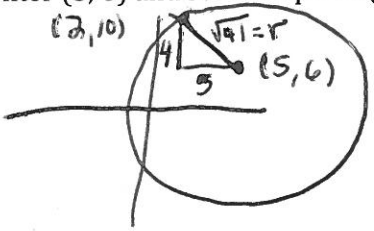


Write the equation of the circle given the following conditions.

8. Center (-12, 5) and radius 6.

$(x+12)^2+(y-5)^2=36$

9. Center (5, 6) and solution point (2, 10).



$r=\sqrt{41}$

$(x-5)^2+(y-6)^2=41$

$\left(x-\left(\frac{9+6}{4}\right)\right)^2+\left(y-\left(\frac{-13b+2}{12}\right)\right)^2=R^2$

10. Endpoints of diameter are $(\frac{3a}{2},\frac{b+1}{3})$ & $(3-a,\frac{-5b}{2})$.

Center: $\left(\frac{\frac{3a}{2}+3-a}{2},\frac{\frac{b+1}{3}+\frac{-5b}{2}}{2}\right)$

$\left(\frac{\frac{3a}{2}+\frac{6}{2}-\frac{2a}{2}}{2},\frac{\frac{2b+2}{6}-\frac{15b}{6}}{2}\right)$

$\left(\frac{9+6}{4},\frac{-13b+2}{12}\right)$

Radius: $\sqrt{\left(3-a-\frac{(9+6)}{4}\right)^2+\left(\frac{-5b}{2}-\frac{(-13b+2)}{12}\right)^2}$

$R=\sqrt{\left(\frac{12-4a-9-6}{4}\right)^2+\left(\frac{30b+13b-2}{12}\right)^2}$

$R^2=\left(\frac{-5a+6}{4}\right)^2+\left(\frac{-17b-2}{12}\right)^2$

11. Bob can dig a 10ft by 10ft hole in 5 hours. Patrick can dig the same hole in 6 hours. Write an equation that represents the number of holes they can dig if they work together. Sketch a graph of the equation. Find the point that solution that represents the amount of time it takes to dig one hole.

1 Hole in 5 Hrs

$\frac{1}{5}$ Hole in 1 Hrs Bob

$\frac{1}{6}$ Hole in 1 Hrs Pat

If x is time in Hrs, & y is Holes

$y=\frac{1}{5}x+\frac{1}{6}x=\frac{6x}{30}+\frac{5x}{30}$

$y=\frac{11x}{30}\rightarrow 1=\frac{11x}{30}\rightarrow x=\frac{30}{11}$