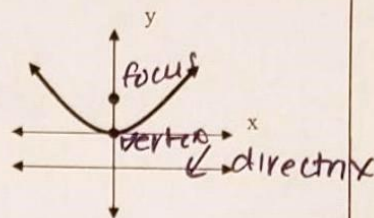


Parabolas

- All Parabolas have a vertex, focus, and directrix.
- The vertex is always the turning point of the parabola.
- The focus is always on the inside of the parabola.
- The directrix is the straight line that is outside the parabola.
- The vertex is the midpoint between the focus and directrix
- The distance between the vertex and focus or the directrix and vertex is referred to as p.



Equation	Vertex	Picture	Focus	Directrix	Axis of symmetry
$(x - h)^2 = 4p(y - k)$ $p > 0$; opens up Ex: $(x-2)^2 = 4(2)(y-3)$ positive, so opens up $p=2$	(h,k) (2,3)		(2,5)	$y = 1$	$x = 2$
$(x - h)^2 = 4p(y - k)$, $p < 0$; opens down Ex: $(x-2)^2 = 4(-1)(y+3)$ opens down $p=-1$	(h,k) (2,-3)		(2,-4)	$y = 2$	$x = 2$
$(y - k)^2 = 4p(x - h)$, $p > 0$; opens right Ex: $(y-2)^2 = 4(2)(x-3)$ opens right $p=2$	(h,k) (3,2)		(5,2)		$y = 2$
$(y - k)^2 = 4p(x - h)$, $p < 0$; opens left Ex: $(y-2)^2 = 4(-1)(x-3)$ opens left $p=-1$	(h,k) (3,2)		(2,2)		$y = 2$

If want to have more precise graph,
 $\frac{4}{1}$ slope on both sides of vertex