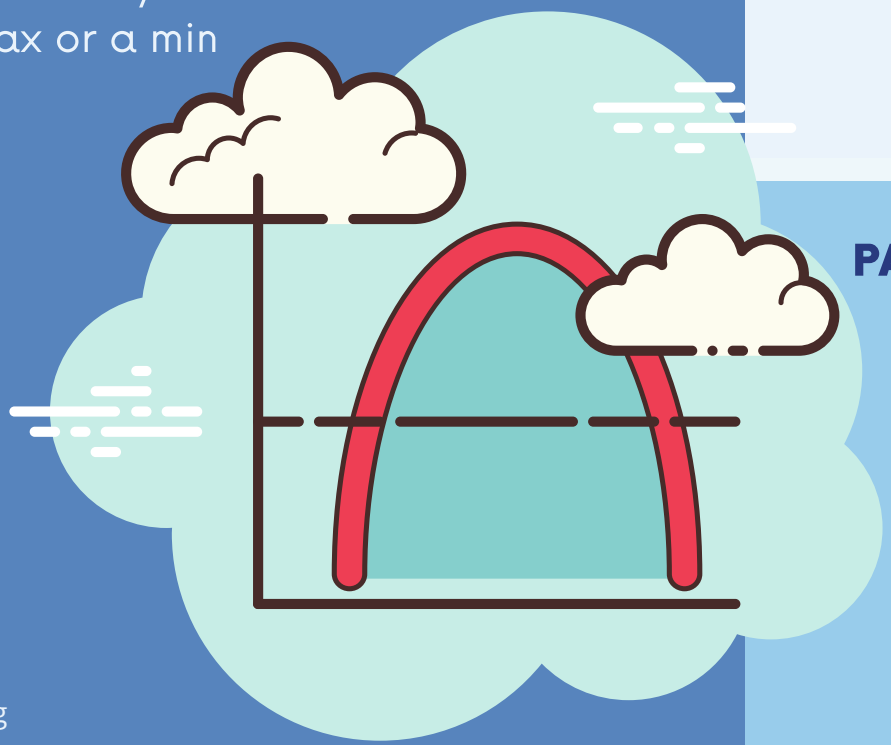
QUADRATIC FUNCTION

Base function: $y = x^2$
Graph is a parabola
Opens up or down
Has 1, 2 or no x-int-s
Has 1 y-int
Has a vertex (h, k)
Axis of symmetry: $x = h$
Has a max or a min



3 FORMS OF THE QUADRATIC EQUATION

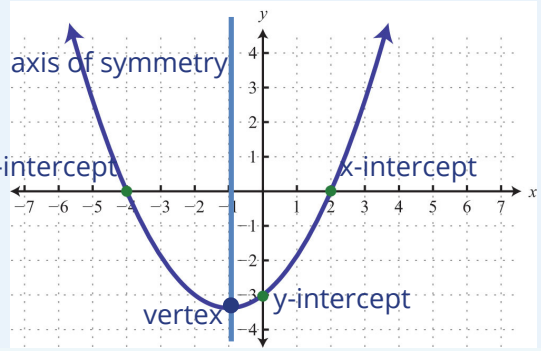
standard: $y = ax^2 + bx + c$ (c is the y-intercept)

factored: $y = a(x - r)(x - s)$ (r, s are the x-intercepts)

vertex: $y = a(x - h)^2 + k$ (h, k - coordinates of vertex)

if a is negative, parabola has a maximum

MAIN FEATURES OF A PARABOLA



PARABOLA TRANSFORMATIONS

$$y = a(x - h)^2 + k$$

If a is positive, parabola opens up; if a is negative, parabola opens down

If a is greater than 1, parabola is vertically stretched; if a is between 0 and 1, parabola is vertically compressed

If h is negative, the vertex is shifted to the right; if h is positive the vertex is shifted to the left

If k is positive, the vertex is shifted up; if k is negative the vertex is shifted down