Quadratics

Standard form

ax^2+bx+c

- $a>0 \Rightarrow$ ∪
- $a<0 \Rightarrow$ ∩
- y-int is c

Vertex Form

$a(x+h)^2+k$

- vertex is at $(-h, k)$

Factored form

$a(x-p)(x-q)$

x-int: $(p, 0)$ and $(q, 0)$

Every quadratic has a standard form and vertex form

but not always factor form!!

- Q: when does a quadratic have factor form?

A: look at discriminant

$$\text{discriminant}(f) = b^2-4ac$$

if $b^2-4ac > 0 \Rightarrow$ 2 different factors!

$b^2-4ac = 0 \Rightarrow$ one (repeating)

factor

$b^2 - 4ac < 0 \Rightarrow$ not factorable

$2x^2 + 10x + 48$

$\text{discr} = b^2 - 4ac$

$= 10^2 - 4(2)(48)$

$4(98)$

$= 100 - 392 < 0$

$(x-5)^2 = x^2 - 10x + 25$

$\text{disc} = b^2 - 4ac$

$= 100 - 4(1)(25)$

$= 0$