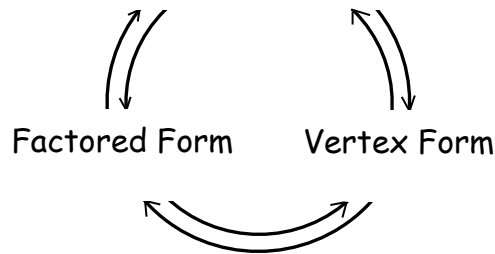


Everything I Need to Know about Quadratics...But Was Afraid to Ask!

Standard Form



If you want...

And you have...

Then do this

Vertex Form $y = a(x - h)^2 + k$	1. Standard Form $y = ax^2 + bx + c$	<ul style="list-style-type: none"> ➤ complete the square or ➤ solve for zeros and use to calculate vertex ➤ "a" will be the same
	2. Factored Form $y = a(x - s)(x - t)$	<ul style="list-style-type: none"> ➤ expand to standard form then convert to vertex form or ➤ solve for zeros and use to calculate vertex ➤ "a" will be the same
Standard Form $y = ax^2 + bx + c$	3. Vertex Form $y = a(x - h)^2 + k$	➤ expand
	4. Factored Form $y = a(x - s)(x - t)$	➤ expand
Factored Form $y = a(x - s)(x - t)$	5. Vertex Form $y = a(x - h)^2 + k$	<ul style="list-style-type: none"> ➤ convert to standard form, then convert to factored form or ➤ solve for zeros and substitute into factored form ➤ "a" will be the same
	6. Standard Form $y = ax^2 + bx + c$	<ul style="list-style-type: none"> ➤ factor, if possible or ➤ use quadratic formula to find zeros and substitute into factored form or ➤ may not have factored form if there are no real roots
to graph	7. Vertex Form $y = a(x - h)^2 + k$	<ul style="list-style-type: none"> ➤ read vertex/transformations directly from equation <ul style="list-style-type: none"> ✓ h is horizontal ✓ k is vertical ✓ a is reflection and stretch/compression for improved accuracy, consider finding y-intercept or applying step pattern.

to graph	8. Standard Form $y = ax^2 + bx + c$	➤ solve for x-intercepts and y-intercept or ➤ solve for vertex and y-intercept
	9. Factored Form $y = a(x - s)(x - t)$	➤ read zeros from equation, solve for y-intercept or vertex

If you want...	And you have...	Then do this
y-intercept	10. Vertex Form $y = a(x - h)^2 + k$	➤ set $x = 0$ and solve for y
	11. Standard Form $y = ax^2 + bx + c$	➤ set $x = 0$ and solve for y or ➤ c
	12. Factored Form $y = a(x - s)(x - t)$	➤ set $x = 0$ and solve for y
vertex, max/min, optimal value	13. Vertex Form $y = a(x - h)^2 + k$	➤ read the vertex right from the equation: (h,k)
	14. Standard Form $y = ax^2 + bx + c$	➤ convert to vertex form or ➤ determine the zeros and use $\frac{s + t}{2}$ to get x-coordinate of vertex (axis of symmetry) ➤ substitute this x to get the y-coordinate or ➤ use $x = -\frac{b}{2a}$ to get x-coordinate of vertex ➤ Substitute this x to get the y-coordinate
	15. Factored Form $y = a(x - s)(x - t)$	➤ use the zeros and $\frac{s + t}{2}$ to get x-coordinate of vertex (axis of symmetry) ➤ substitute this x to get the y-coordinate or ➤ convert to standard form then complete the square
	16. Vertex Form $y = a(x - h)^2 + k$	➤ convert to standard form then factor or use quadratic formula or ➤ set $y = 0$ then solve for x using inverse operations

	17. Standard Form $y = ax^2 + bx + c$	➤ factor if possible or ➤ use quadratic formula or ➤ may not have real roots
	18. Factored Form $y = a(x - s)(x - t)$	➤ read the zeros right from the equation: s & t
the number of zeros	19. Vertex Form $y = a(x - h)^2 + k$	➤ analyze location of vertex and opening direction, draw conclusions
	20. Standard Form $y = ax^2 + bx + c$	➤ use discriminant: $D < 0$, $D = 0$, $D > 0$
	21. Factored Form $y = a(x - s)(x - t)$	➤ zeros are given in this form