Quadratics notes to understand wth is going on

- quadratics notes
- The quadratic formula:
- how to find x and y intercepts
- when i know the y value of the vertex, how do i find the x value?

quadratics notes

- Quadratic equation standard form: ax^2 + bx + c = 0 This is the standard form for any quadratic equation, where a, b, and c are constants. It can be used to find the roots or zeros of the equation by using the quadratic formula.

- Quadratic formula: x = (-b ± ?(b^2 - 4ac)) / 2a This formula is used to find the roots (x-intercepts) of a quadratic equation in standard form. It gives the two possible values for x when the equation is equal to zero.

- Axis of symmetry: x = -b / 2a This formula is used to find the vertical line that divides the parabola into two symmetrical halves. It can help in graphing the quadratic function and finding the vertex.

- Vertex form: y = a(x - h)^2 + k This form is useful for easily identifying the vertex of a quadratic equation, where (h, k) is the vertex point. It can be used to graph the parabola or find the maximum/minimum value.

- Completing the square: x^2 + bx + c = a(x - h)^2 + k This method is used to convert a quadratic equation from standard form to vertex form. It involves adding and subtracting a constant term to make the left side a perfect square trinomial.

- Discriminant: ? = b^2 - 4ac The discriminant is used to determine the nature of the roots of a quadratic equation. It can help predict whether the equation has real or complex roots and how many distinct solutions it has.

- Factored form: y = a(x - p)(x - q) This form is useful for quickly identifying the roots of a quadratic equation, where p and q are the x-intercepts. It can also be used to find the factors of the quadratic equation.

- Parabola focus: F(h, k + 1/4a) The focus is a point that defines the geometric property of a parabola. It can be used to find the directrix and derive the equation of a parabola from its geometric definition.

- Parabola directrix: y = k - 1/4a The directrix is a horizontal line that is equidistant from the focus and vertex of the parabola. It can be used in the geometric definition of a parabola and to find its equation from given points.

The quadratic formula:

$$x = (-b \pm ?(b^2 - 4ac)) / 2a$$

The formula gives you two possible results for the values of "x" that satisfy the quadratic equation y = ax^2 + bx + c.

The two possible values of "x" correspond to the x-coordinates of the points where the parabolic curve intersects the x-axis, also known as the x-intercepts or roots of the quadratic equation.

If the discriminant (b^2 - 4ac) is positive, then the quadratic equation has two real roots, and the parabolic curve intersects the x-axis at two distinct points. In this case, you will get two different values of "x" when you use the quadratic formula.

If the discriminant is zero, then the quadratic equation has one real root with a multiplicity of two, and the parabolic curve touches the x-axis at exactly one point. In this case, you will get the same value of "x" twice when you use the quadratic formula.

If the discriminant is negative, then the quadratic equation has two complex roots, and the parabolic curve does not intersect the x-axis. In this case, you will get two different complex values of "x" when you use the quadratic formula.

In summary, the two possible results from the quadratic formula correspond to the x-coordinates of the points where the parabolic curve intersects the x-axis, and the number and nature of these points depend on the value of the discriminant.

how to find x and y intercepts

- Find the x-intercept by plugging in 0 for y.
- Find the y-intercept by plugging in 0 for x

when i know the y value of the vertex, how do i find the x value?

If you know the y-coordinate of the vertex of a quadratic function, you can use the vertex form of the function to find the x-coordinate of the vertex.

The vertex form of a quadratic function is:

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

where (h, k) is the vertex of the parabola.

If you know the y-coordinate of the vertex, which is k in the vertex form equation, you can substitute it into the equation to get:

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

Simplifying this equation, we get:

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

Dividing both sides by "a", we get:

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

Taking the square root of both sides, we get:

$\sqrt{((y - k) / a)} = x - h$

Adding "h" to both sides, we get:

$x = h \pm \sqrt{((y - k) / a)}$

So, to find the x-coordinate of the vertex, you can use the formula:

$x = h \pm \sqrt{((y - k) / a)}$

where "h" is the x-coordinate of the vertex, "k" is the y-coordinate of the vertex, and "a" is the coefficient of the x^2 term in the quadratic function.