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.

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