

H. Algebra II Semester II Review

Part 2 - Quadratic Functions

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2.a Quadratic Formula

Complete the square and solve for x to derive the quadratic formula.

1. $ax^2+bx+c=0$

2.b Solving Quadratic Equations

Solve the following quadratic equations by factoring.

1. $-18x^2+33x=5$

2. $16x^2-3=-22x$

Solve the following quadratic equations by using the quadratic formula or completing the square. Include complex solutions.

3. $x^2+6x=-4$

4. $\frac{2x^2+16}{5}=2x$

5. $\frac{x^2}{2}+1=\frac{x}{5}$

6. $5=4x(2x+3)$

2.c Quadratic Function Vertex Properties

Find the Vertex coordinates by completing the square to create vertex form.

1. $f(x)=x^2+8x+6$

Find the Vertex coordinates by first finding the x-intercepts and then averaging them to obtain the vertex x-coordinate.

2. $f(x)=-x^2-3x+10$

Find the Vertex coordinates by using the formula $x=\frac{-b}{2a}$ to obtain the vertex x-coordinate.

3. $f(x)=2x^2-6x+2$

Characterize each vertex above as a maximum or minimum. If the parabola opens upward ($a>0$) the vertex is a minimum. If the parabola opens downward ($a<0$) the vertex is a maximum. Remember the actual maximum / minimum is the y-coordinate of the vertex

2.d Graphing Quadratic Functions

Graph the following quadratic functions. Always find the vertex coordinates first, then find a pair of locations on either side of the vertex. Sketch the parabola once you have coordinates of these three locations.

1. $f(x)=2(x-3)^2+1$

2. $f(x)=-x^2+6x-10$

2.e Fitting a Quadratic Function

Find the quadratic that passes through the following three points. Remember you can begin the function form $f(x)=ax^2+bx+c$ then create an equation from each point with a , b and c as unknowns. Solve the three variable system to obtain the values of the coefficients a , b and c so you can construct the quadratic

1. $(-1,25),\left(\frac{1}{2},-7\right),(3,3)$