

Algebra Builds Your Dream Home

A Real World Application For Using
Quadratic Functions

The Norm

- Quadratic functions are usually some of the hardest math concepts to represent in real life.
- The traditional representation is either a basketball shot, a bouncing ball, or a rocket fired into the air.
- This activity uses floor plans created by the students to show how quadratics could be used in real life.

The Project

- This project can take anywhere from one week to up to six weeks.
- It can be used in different subjects from sixth grade math all the way up to calculus.
- I have used this project from the seventh grade on up to pre-cal. It will be presented at the Algebra I level, with extensions to the other levels.

Beginning

- Discuss how many bedrooms, bathrooms, closets, and the size that these should be.
- Start by surveying the students about what their idea of the perfect home is.
- Discuss any specialty rooms such as gym, game rooms, indoor swimming pools.
- Send them home to research their “dream home.”

Following Day

- Begin by discussing their research and what they found.
- Pass out a ruler and graph paper and have the students work on the floor plan of their “dream home.”
- While they are beginning, have some floor plans circling the room. These can be downloaded from the internet.

Sample

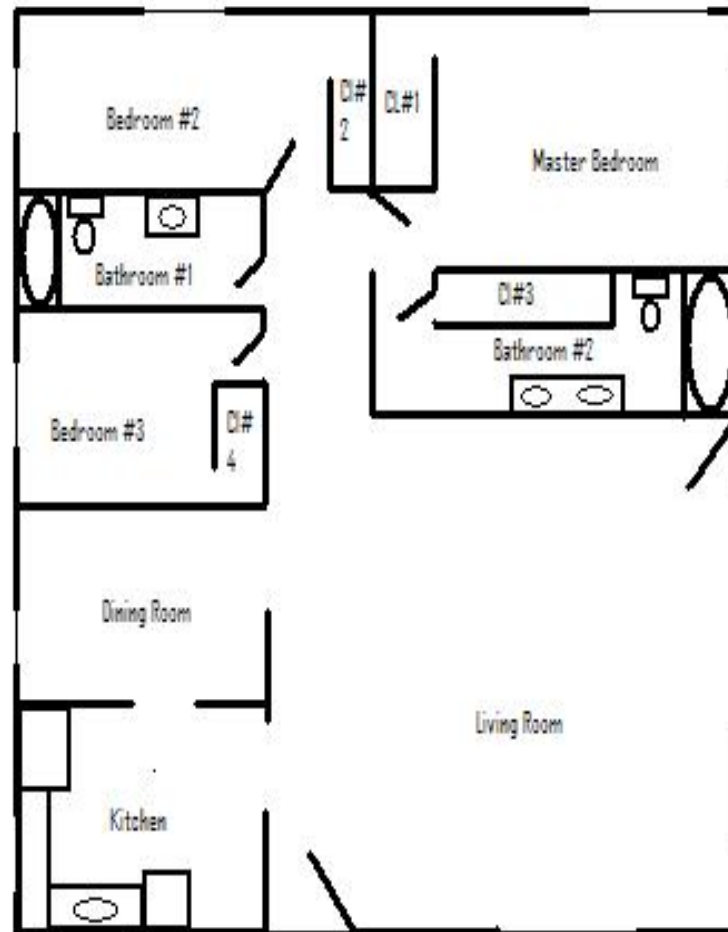
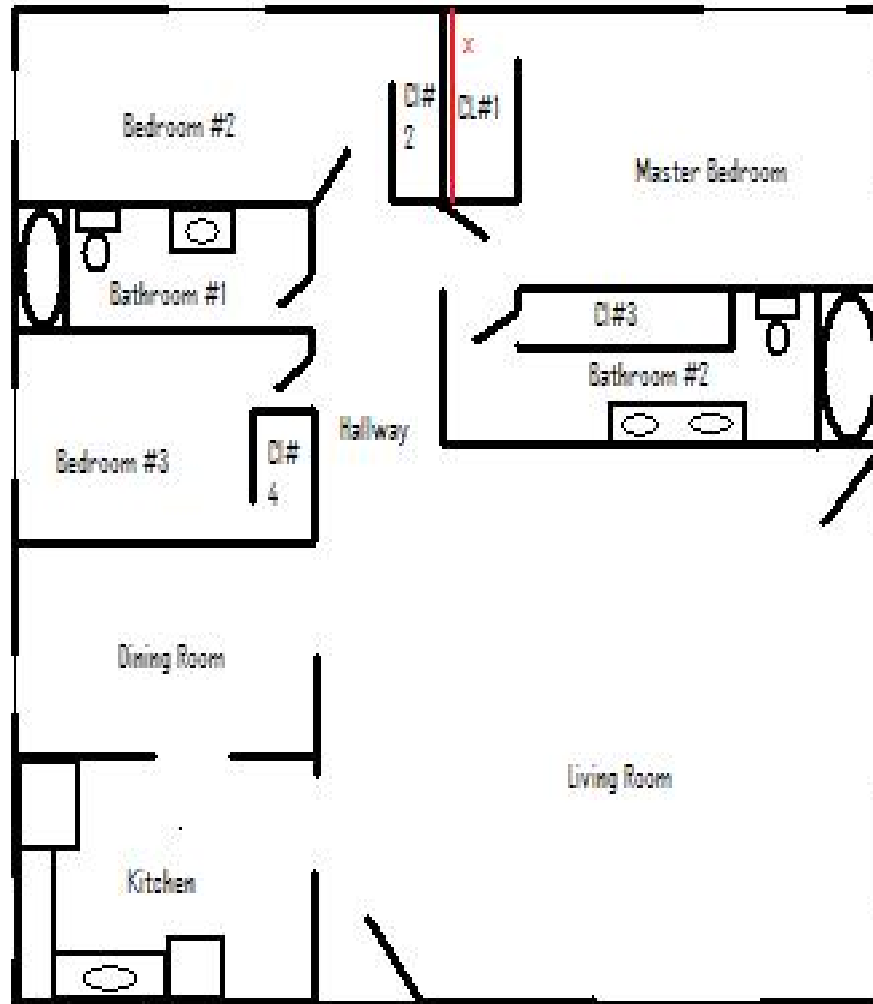


Table of Values

Room Name	Length	Width	Perimeter	Area
Master Bdrm.	14 ft	12 ft	52 ft	168 ft ²
Closet #1	4 ft	8 ft	24 ft	32 ft ²
Bathroom #1	12 ft	6 ft	36 ft	72 ft ²
Bedroom #2	14 ft	10 ft	48 ft	140 ft ²
Entire House	32 ft	44 ft	156 ft	1408 ft ²



2nd Table of Values (x=8)

Room Name	Length	Width	Perimeter	Area
Master Bdrm.	$(x+6)$ ft	$(x+4)$ ft	$(4x+20)$ ft	$x^2+20x+24$ ft ²
Closet #1	$(x-4)$ ft	x ft	$(4x-8)$ ft	x^2-4x ft ²
Bathroom #1	$(x+4)$ ft	$(x-2)$ ft	$(4x+4)$ ft	x^2+2x-8 ft ²
Bedroom #2	$(x+6)$ ft	$(x+2)$ ft	$(4x+16)$ ft	$x^2+8x+12$ ft ²
Entire House	$4x$ ft	$5x+4$ ft		

Solve the Quadratic

- Take both values for the area of the first room and set them equal to each other and solve for x .

- $x^2 + 20x + 24 = 168$

- Have the students repeat the process for each room.

Teacher Notes

- Several things will occur when this project is done.
- The students should have an understanding of extraneous solutions.
- An understanding of Architectural design and application.
- A better understanding of solving quadratic equations.

The End

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