

Solving Quadratics Graphically
Virginia Department of Education
Algebra Instructional Modules
Reporting Category: Equations and Inequalities

Background Information:

- Students will need to know how to identify a x-intercept and a y-intercept.
 - Students will need to have experience using the Y= function and the table function of the graphing calculator.
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Materials and Equipment:

- Graphing calculator and view screen
 - Overhead projector
 - Each student will need graphing calculator and handouts.
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Notes to Teacher:

- In this activity students “discover” the significance of numbers in the quadratic equation.
- In this activity sheet, the equation, graph and table are ALREADY matched. You will need to make multiple copies to use this activity fully.
- In this activity students will relate the equation of a quadratic to the graph of the quadratic and to a table of values.
- Each piece of information may be used in more than one way
- Suggestions:
 - Copy the handout, cut up the pieces, tape each on an card, you will want to number the cards and have a “key” card so you can do a quick check of the student’s mathematics.
 - Each day, hand out the index cards with the tables on them, have students find equation of their own quadratic.
 - Repeat the activity at the beginning of class as a quick review daily.
 - Repeat the process with the graph.

Bonus: Repeat the process with the equation having the students sketch the graph or give you a table of values for the equation that they are holding. Relate the $f(x)$ to the ordinate on the graph.

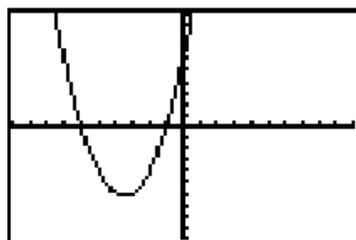
Bonus: Discuss the stretching action of a GCF and how to determine if the graph has been stretched or shrunk and by what value. Discuss complex roots and why there are no real roots.

- Students may work alone or in pairs on this activity.
- The time allotted for this activity varies depending on the ability level of the students.

Activity Sheet: Match the quadratic equation to its graph and to its table of values.

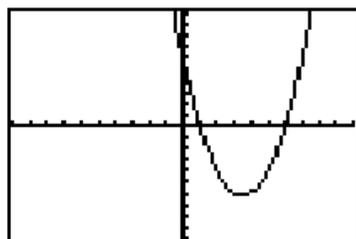
WINDOW FORMAT
 Xmin=-10
 Xmax=10
 Xscl=1
 Ymin=-10
 Ymax=10
 Yscl=1

Y1 = $X^2 + 7X + 6$
 Y2 =
 Y3 =
 Y4 =
 Y5 =
 Y6 =
 Y7 =
 Y8 =



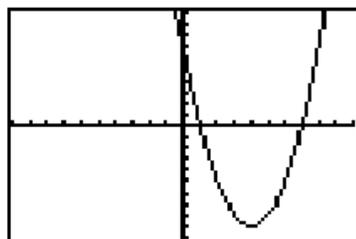
| X | Y1 | |
|----|----|--|
| -6 | 0 | |
| -1 | 0 | |
| 0 | 6 | |
| X= | | |

Y1 = $X^2 - 7X + 6$
 Y2 =
 Y3 =
 Y4 =
 Y5 =
 Y6 =
 Y7 =
 Y8 =



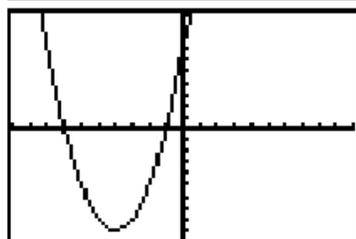
| X | Y1 | |
|----|----|--|
| 1 | 0 | |
| 6 | 0 | |
| 0 | 6 | |
| X= | | |

Y1 = $X^2 - 8X + 7$
 Y2 =
 Y3 =
 Y4 =
 Y5 =
 Y6 =
 Y7 =
 Y8 =



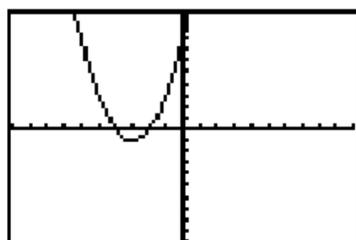
| X | Y1 | |
|----|----|--|
| 1 | 0 | |
| 7 | 0 | |
| 0 | 7 | |
| X= | | |

Y1 = $X^2 + 8X + 7$
 Y2 =
 Y3 =
 Y4 =
 Y5 =
 Y6 =
 Y7 =
 Y8 =



| X | Y1 | |
|----|----|--|
| -7 | 0 | |
| -1 | 0 | |
| 0 | 7 | |
| X= | | |

Y1 = $X^2 + 6X + 8$
 Y2 =
 Y3 =
 Y4 =
 Y5 =
 Y6 =
 Y7 =
 Y8 =



| X | Y1 | |
|----|----|--|
| -4 | 0 | |
| -2 | 0 | |
| 0 | 8 | |
| X= | | |

$$Y_1 = X^2 - 6X + 8$$

$$Y_2 =$$

$$Y_3 =$$

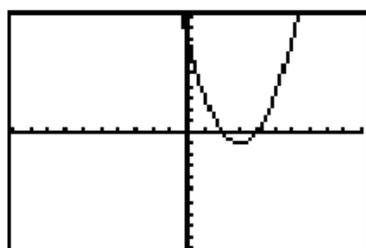
$$Y_4 =$$

$$Y_5 =$$

$$Y_6 =$$

$$Y_7 =$$

$$Y_8 =$$



| X | Y1 | |
|---|----|--|
| 2 | 0 | |
| 4 | 0 | |
| 0 | 8 | |

$$X =$$

$$Y_1 = X^2 + 2X - 8$$

$$Y_2 =$$

$$Y_3 =$$

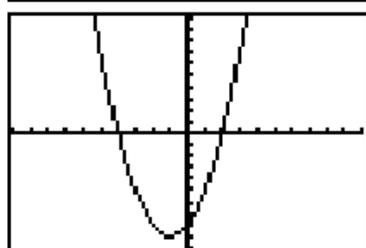
$$Y_4 =$$

$$Y_5 =$$

$$Y_6 =$$

$$Y_7 =$$

$$Y_8 =$$



| X | Y1 | |
|----|----|--|
| -4 | 0 | |
| 2 | 0 | |
| 0 | -8 | |

$$X =$$

$$Y_1 = X^2 - 9$$

$$Y_2 =$$

$$Y_3 =$$

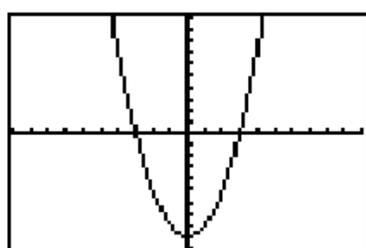
$$Y_4 =$$

$$Y_5 =$$

$$Y_6 =$$

$$Y_7 =$$

$$Y_8 =$$



| X | Y1 | |
|----|----|--|
| -3 | 0 | |
| 3 | 0 | |
| 0 | -9 | |

$$X =$$

$$Y_1 = X^2 - 4$$

$$Y_2 =$$

$$Y_3 =$$

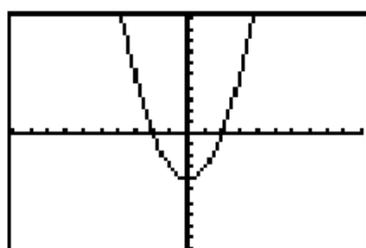
$$Y_4 =$$

$$Y_5 =$$

$$Y_6 =$$

$$Y_7 =$$

$$Y_8 =$$



| X | Y1 | |
|----|----|--|
| -2 | 0 | |
| 2 | 0 | |
| 0 | -4 | |

$$X =$$

$$Y_1 = 2X^2 + 12X + 10$$

$$Y_2 =$$

$$Y_3 =$$

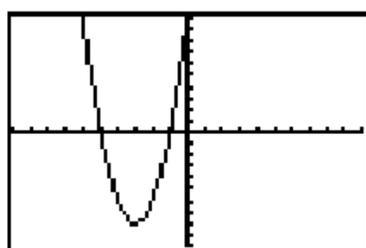
$$Y_4 =$$

$$Y_5 =$$

$$Y_6 =$$

$$Y_7 =$$

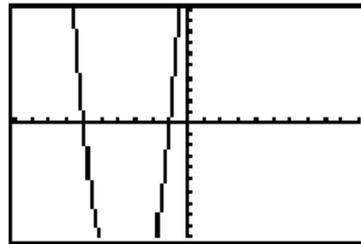
$$Y_8 =$$



| X | Y1 | |
|----|----|--|
| -5 | 0 | |
| -1 | 0 | |
| 0 | 10 | |

$$X =$$

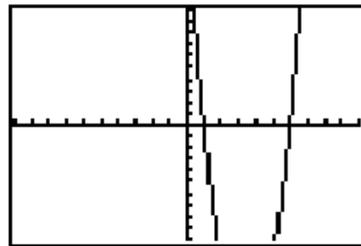
$$Y_1 = 3X^2 + 21X + 18$$



| X | Y1 | |
|----|----|--|
| -6 | 0 | |
| -1 | 0 | |
| 0 | 18 | |

X=

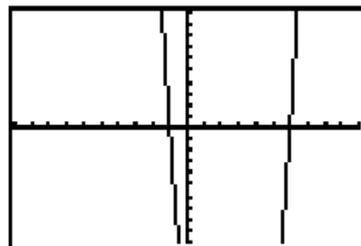
$$Y_1 = 3X^2 - 21X + 18$$



| X | Y1 | |
|---|----|--|
| 1 | 0 | |
| 6 | 0 | |
| 0 | 18 | |

X=

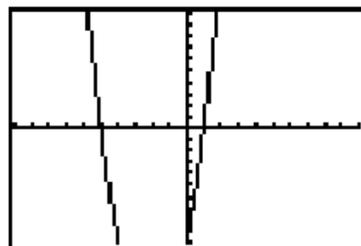
$$Y_1 = 3X^2 - 15X - 18$$



| X | Y1 | |
|----|-----|--|
| -1 | 0 | |
| 6 | 0 | |
| 0 | -18 | |

X=

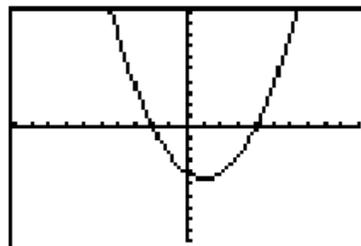
$$Y_1 = 2X^2 + 8X - 10$$



| X | Y1 | |
|----|-----|--|
| -5 | 0 | |
| 1 | 0 | |
| 0 | -10 | |

X=

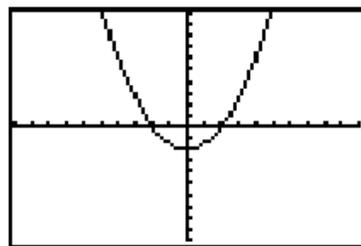
$$Y_1 = \frac{1}{2}(X^2 - 2X - 8)$$



| X | Y1 | |
|----|----|--|
| -2 | 0 | |
| 4 | 0 | |
| 0 | -4 | |

X=

$$Y_1 = \frac{1}{2}(X^2 - 4)$$



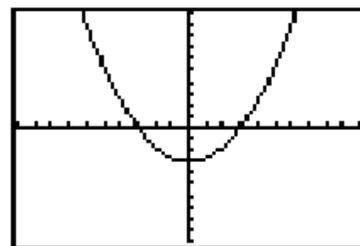
| X | Y1 | |
|----|----|--|
| -2 | 0 | |
| 2 | 0 | |
| 0 | -2 | |

X=

```

Y1 = (1/3)(X^2-9)
Y2 =
Y3 =
Y4 =
Y5 =
Y6 =
Y7 =
Y8 =

```



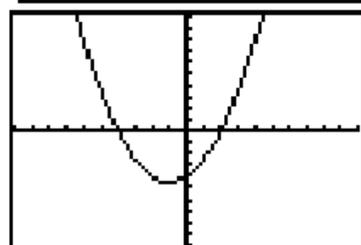
| X | Y1 | |
|----|----|--|
| -3 | 0 | |
| 0 | -3 | |
| 3 | 0 | |

X=

```

Y1 = (1/2)(X^2+2X-8)
Y2 =
Y3 =
Y4 =
Y5 =
Y6 =
Y7 =

```



| X | Y1 | |
|----|----|--|
| -4 | 0 | |
| -2 | -5 | |
| 2 | 0 | |

X=

```

PROGRAM: IMAG
:ClrDraw
:Text(4,30,"IMAG
INARY")
:Text(35,76,"REA
LS")

```