

Activity: Quadratic Function Detectives

Activity Overview

Students work as “function detectives” to classify equations, identify polynomial degrees, and investigate why quadratic functions produce parabolic graphs.

Time: 30–40 minutes

Grouping: Pairs or groups of three

Materials: Function cards, graph paper, rulers, pencils, and calculators or graphing software if available

Part 1: Function Card Sort

Cut out or display the function cards below. Students must place each function into one of three categories:

- Quadratic functions
- Linear functions
- Other functions

For every polynomial, students should also identify its degree.

Function Cards

1. $y = 3x^2 + 2x - 1$	5. $y = \frac{4}{x}$	9. $y = (x + 3)(x - 1)$
2. $y = 5x - 4$	6. $y = 6 - x^2$	10. $y = 4x^2$
3. $y = x^3 + 2$	7. $y = 8$	11. $y = 7x + 2x^2 - 5$
4. $y = -2x^2 + 7$	8. $y = 2x^4 - x$	12. $y = \sqrt{x} + 1$

Student Recording Table:

Card	Function type	Degree, if polynomial	Evidence
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Find the Hidden Quadratics

Some quadratic functions are not immediately written in standard form.

The standard form of a quadratic function is: $y = ax^2 + bx + c$ where $a \neq 0$

Rewrite each function in standard form. Then identify a, b, and c.

Function A

$$y = (x+3)(x-1)$$

Standard form: _____

a = _____ b = _____ c = _____

Function B

$$y = 7x + 2x^2 - 5$$

Standard form: _____

a = _____ b = _____ c = _____

Function C

$$y = (x+2)^2$$

Standard form: _____

a = _____ b = _____ c = _____

Discussion Question

What feature must be present for an equation to represent a quadratic function?