

Graphing from a Table

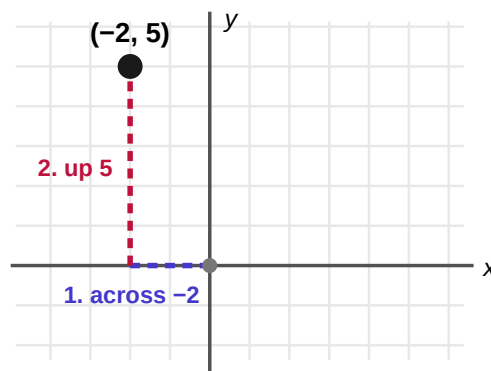
TWO JOBS, IN ORDER: first **plot every point exactly**, then **step back and name the shape**. Do not try to guess the shape from the numbers before you have plotted it. Five points is usually enough to see which family it belongs to.

Plotting a Point

across first, then up or down

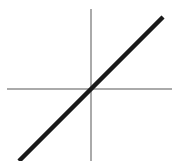
- Each row of the table is **one point**, written (x, y) .
- Start at the origin. Move **across** by the x value: right if positive, left if negative.
- From there move **up or down** by the y value.
- Mark the point. Repeat for every row, then connect them with a smooth curve or a straight edge, whichever the points call for.

WATCH OUT: x always comes first. The point $(-2, 5)$ is two left and five up. Plotting it as two up and five right puts you somewhere else entirely.



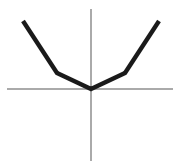
The Five Shapes You Will See

name the family, not the equation



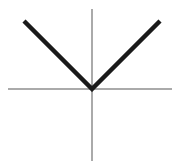
LINE

constant slope



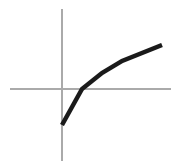
PARABOLA

U, one smooth turn



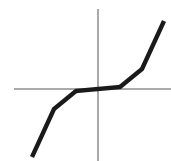
ABSOLUTE VALUE

V, sharp corner



SQUARE ROOT

rises, then flattens



CUBIC

S curve, two bends

Spotting the Family in the Numbers

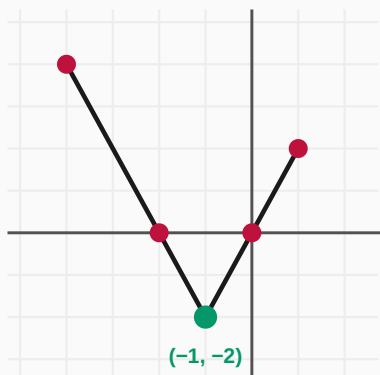
a useful check after you plot

SHAPE	WHAT THE TABLE LOOKS LIKE	QUICK EXAMPLE
Line	For equal steps in x , y changes by the same amount every time .	y goes 1, 3, 5, 7 always +2
Absolute value	Steps of the same size, but the direction flips at one point, and that point is a sharp corner.	y goes 4, 2, 0, 2, 4 down then up
Parabola	Also turns around, but the steps grow smoothly , so the bottom is rounded rather than pointed.	y goes 4, 1, 0, 1, 4 steps 3, 1, 1, 3
Square root	The x values are often perfect squares , and y climbs more and more slowly.	$x = 0, 1, 4, 9, 16$ big x jumps, small y jumps
Cubic	Rises, briefly flattens in the middle, then rises again. No turning back.	y goes -8, -1, 0, 1, 8

Plot the Points, Then Name the Figure

all three from the review

#14 · THE ANSWER IS A V

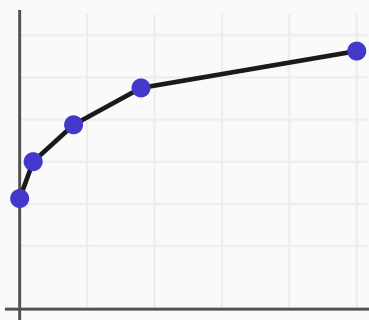


Going left from $(-1, -2)$ the points climb 2 each step. Going right they also climb 2 each step. Equal steps that flip direction at a **sharp corner**.

Absolute value graph (a V)

Vertex at $(-1, -2)$. Rule: $y = 2|x + 1| - 2$.

#15 · THE ANSWER IS A SQUARE ROOT CURVE

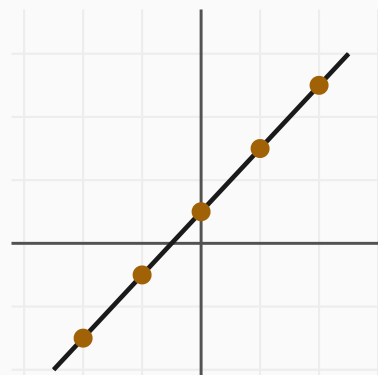


x jumps get bigger, y jumps do not

The x values 0, 1, 4, 9, 25 are perfect squares, while y only climbs by 1 each row. The curve rises fast at first, then **flattens out**.

Square root curve

#16 · THE ANSWER IS A LINE



Every time x goes up by 1, y goes up by **exactly 2**. A constant step means a constant slope.

Straight line

Slope 2, y-intercept $(0, 1)$. Rule: $y = 2x + 1$.

WATCH OUT: a V and a parabola both turn around, and from a small table they can look alike. The test is the **steps**. If the steps stay the same size all the way through, like 2, 2, 2, 2, it is a **V**. If the steps grow as you move away from the turn, like 1, 3, 5, it is a **parabola**.