

Library of Functions

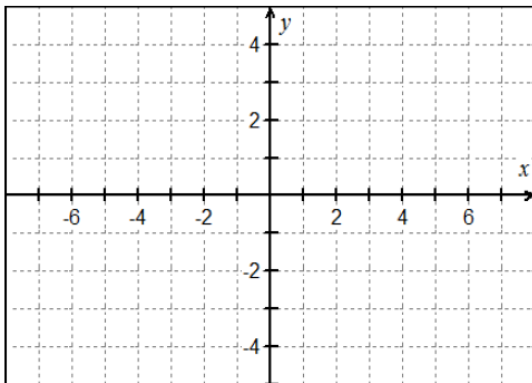
Analyzing Functions

You should be able to give a complete analysis for each of the “parent functions”. The analysis should include as many of the following as possible:

- Domain
- Range
- Roots
- y-intercept(s)
- Increasing/decreasing behavior
- Symmetry (even/odd)
- Boundedness
- Local extrema
- Horizontal asymptotes
- Vertical asymptotes
- End behavior
- Continuity

For each function, sketch the graph and analyze for features in the list above.

Constant Function



$$f(x) = c$$

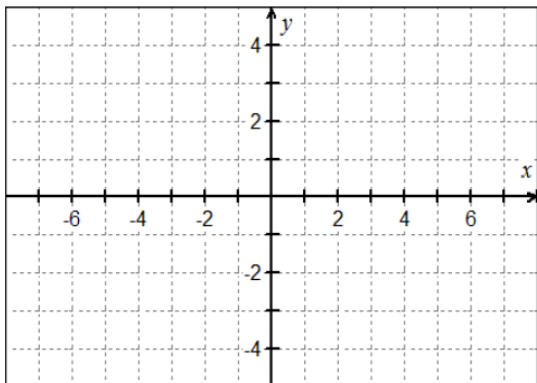
Domain:

Range:

End behavior:

Other:

Identity Function



$$f(x) = x$$

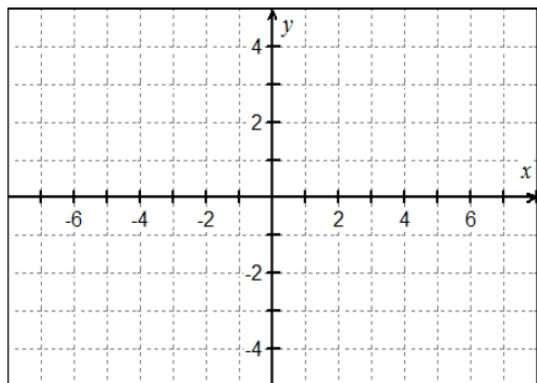
Domain:

Range:

End behavior:

Other:

Quadratic Function



$$f(x) = x^2$$

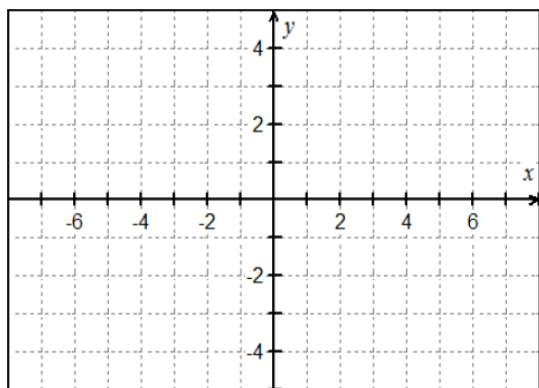
Domain:

Range:

End behavior:

Other:

Cubic Function



$$f(x) = x^3$$

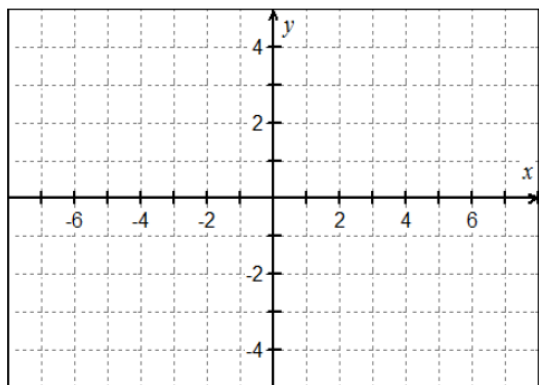
Domain:

Range:

End behavior:

Other:

Square Root Function



$$f(x) = \sqrt{x}$$

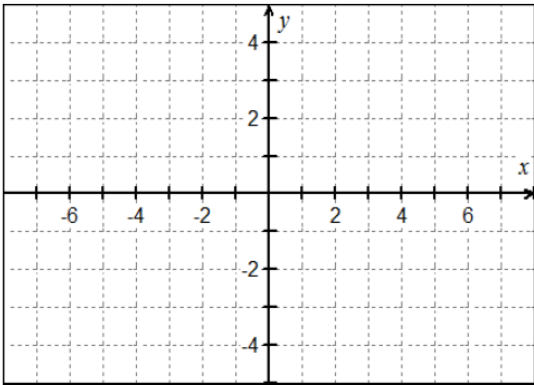
Domain:

Range:

End behavior:

Other:

Cube Root Function



$$f(x) = \sqrt[3]{x}$$

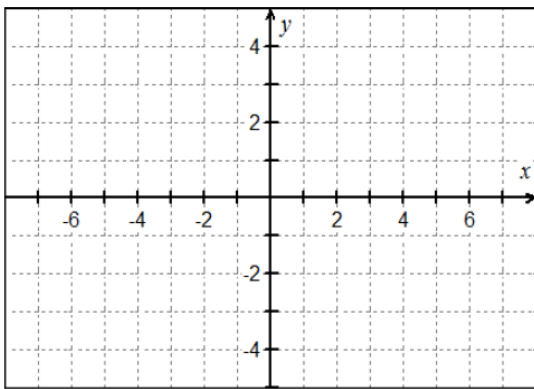
Domain:

Range:

End behavior:

Other:

Exponential Function



$$f(x) = b^x \text{ (base 2)}$$

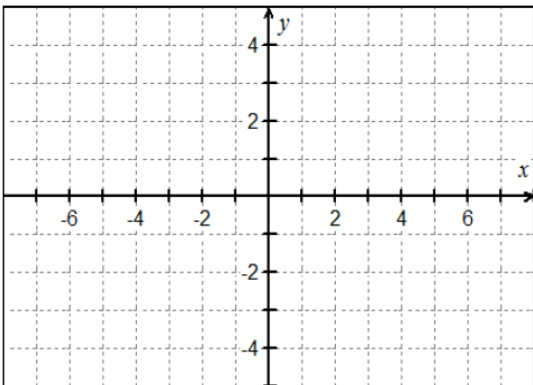
Domain:

Range:

End behavior:

Other:

Absolute Value Function



$$f(x) = |x| = \begin{cases} -x, & x < 0 \\ x, & x \geq 0 \end{cases}$$

Domain:

Range:

End behavior:

Other: