

Library of Functions

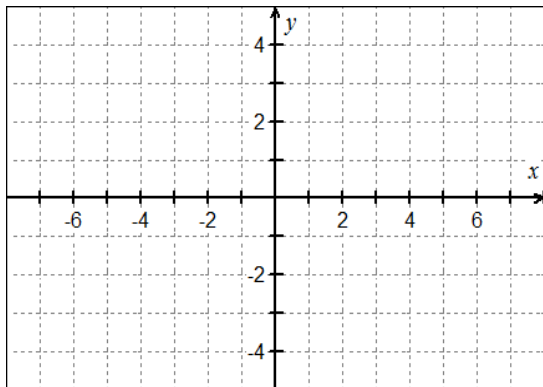
Analyzing Functions

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



$$f(x) = c$$

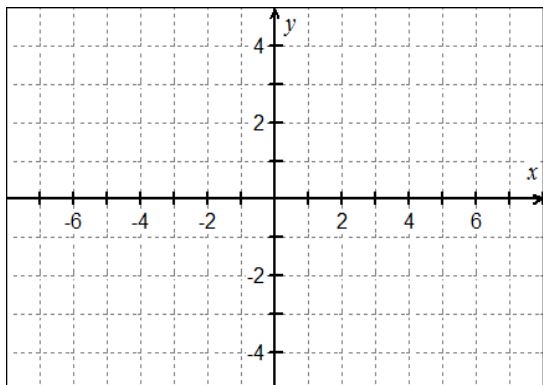
Domain:

Range:

End behavior:

Other:

Identity Function



$$f(x) = x$$

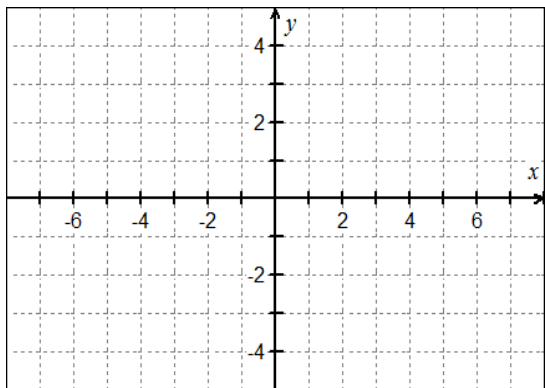
Domain:

Range:

End behavior:

Other:

Reciprocal Function



$$f(x) = \frac{1}{x}$$

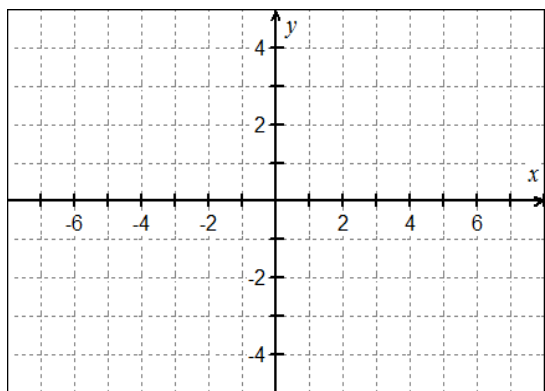
Domain:

Range:

End behavior:

Other:

Quadratic Function



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

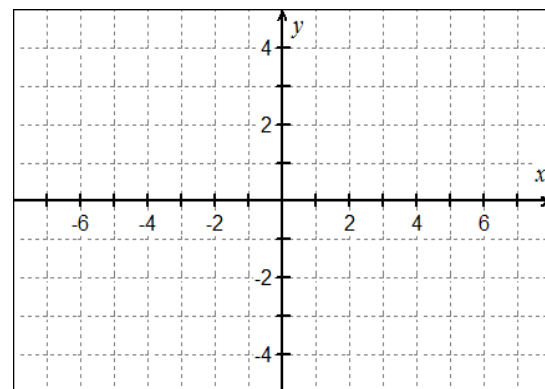
Domain:

Range:

End behavior:

Other:

Cubic Function



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

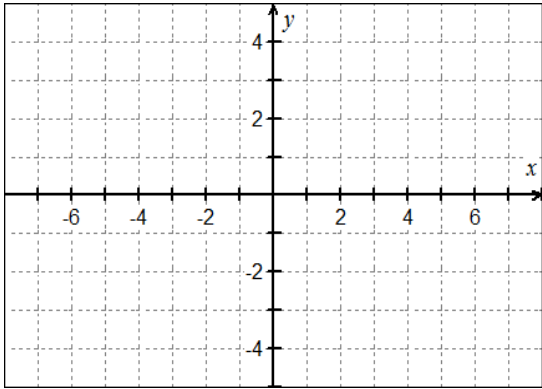
Domain:

Range:

End behavior:

Other:

Square Root Function



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

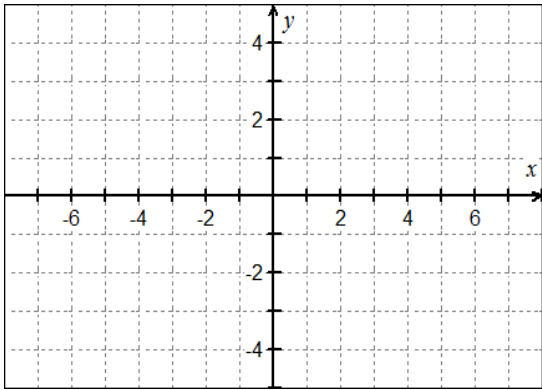
Domain:

Range:

End behavior:

Other:

Cube Root Function



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

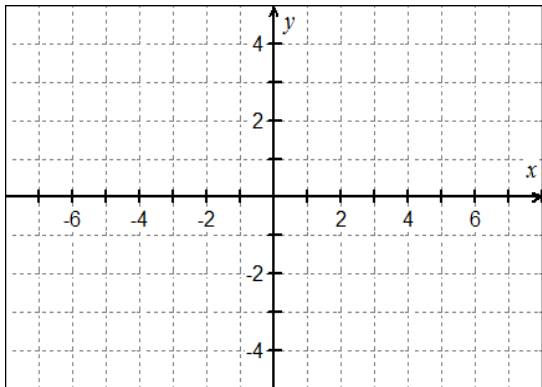
Domain:

Range:

End behavior:

Other:

Exponential Function



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

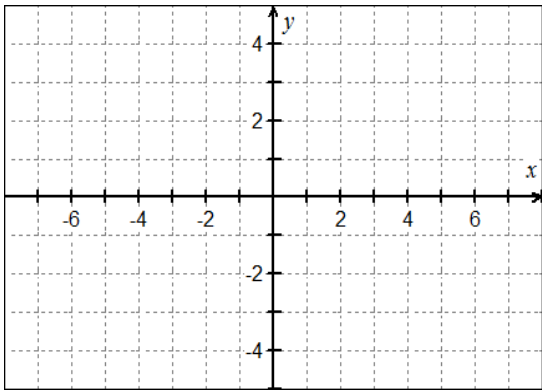
Domain:

Range:

End behavior:

Other:

Logarithmic Function



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

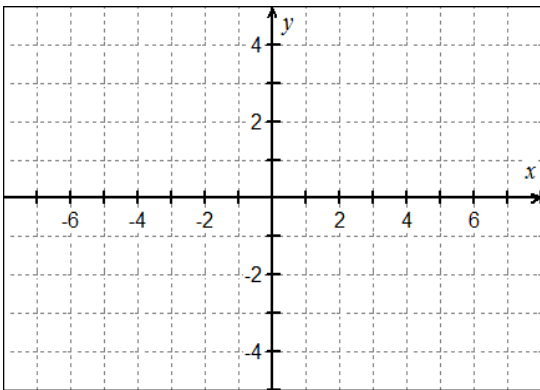
Domain:

Range:

End behavior:

Other:

Absolute Value Function



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

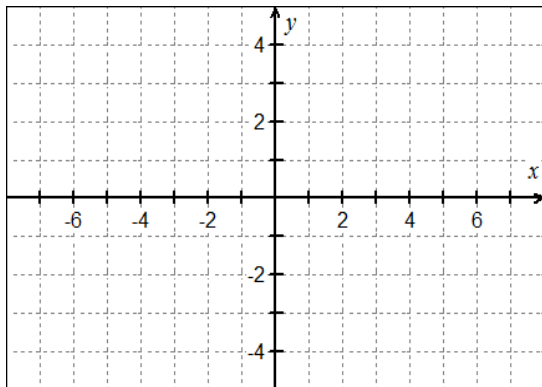
Domain:

Range:

End behavior:

Other:

Greatest Integer Function



$$f(x) = \lceil x \rceil \text{ or } f(x) = \lfloor x \rfloor$$

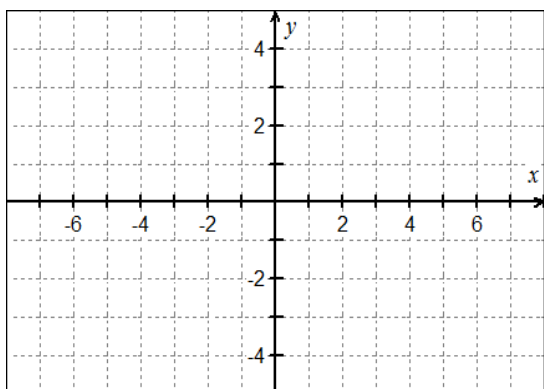
Domain:

Range:

End behavior:

Other:

Signum Function



$$f(x) = \begin{cases} \frac{|x|}{x}, & x \neq 0 \\ 0, & x = 0 \end{cases}$$

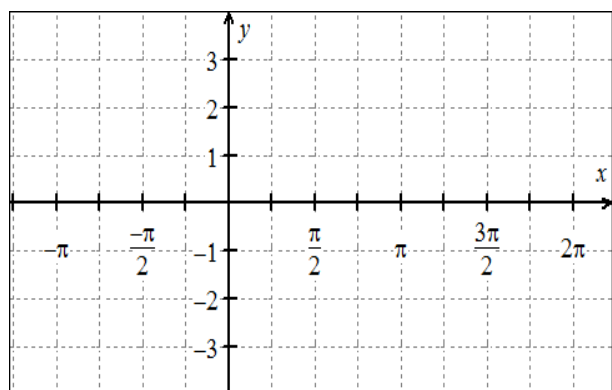
Domain:

Range:

End behavior:

Other:

$y = \sin x$



$$f(x) = \sin x$$

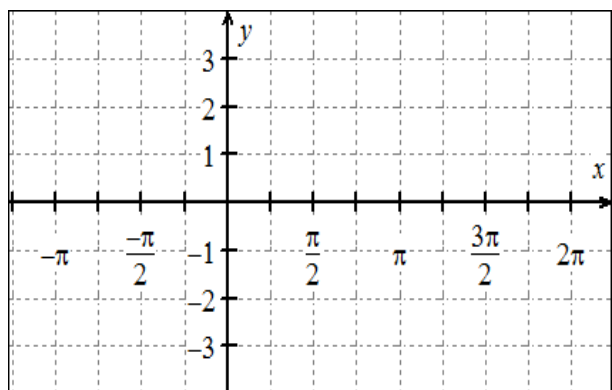
Domain:

Range:

Period:

Other:

$y = \cos x$



$$f(x) = \cos x$$

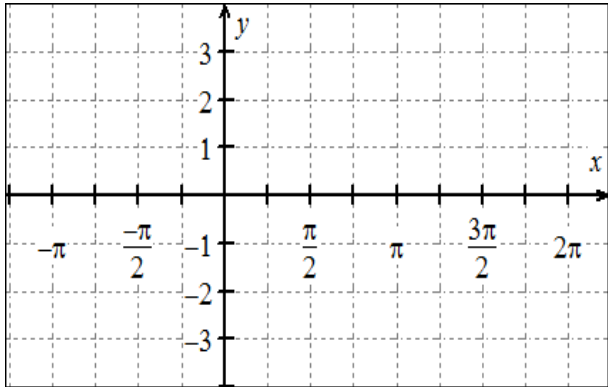
Domain:

Range:

Period:

Other:

$y = \tan x$



$$f(x) = \tan x$$

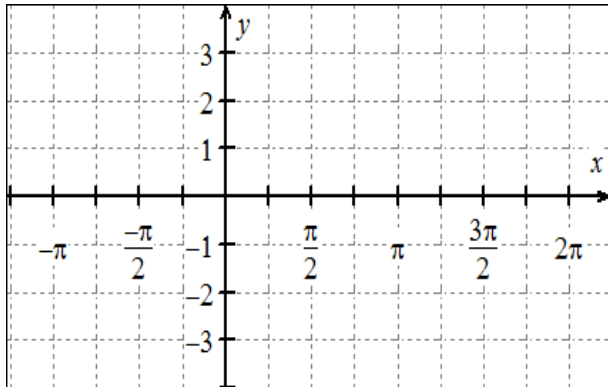
Domain:

Range:

Period:

Other:

$y = \cot x$



$$f(x) = \cot x$$

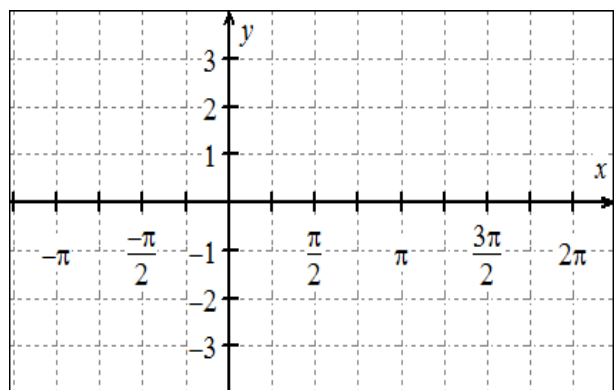
Domain:

Range:

Period:

Other:

$y = \csc x$



$$f(x) = \csc x$$

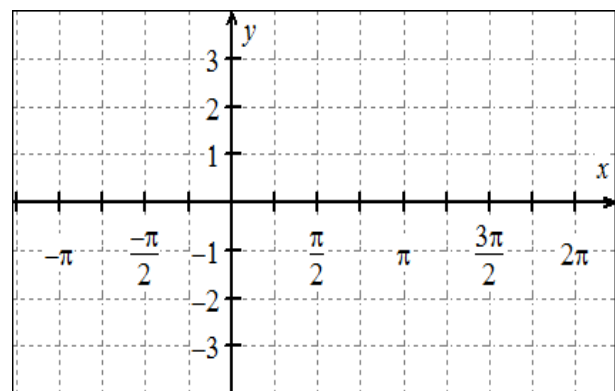
Domain:

Range:

Period:

Other:

$y = \sec x$



$$f(x) = \sec x$$

Domain:

Range:

Period:

Other: