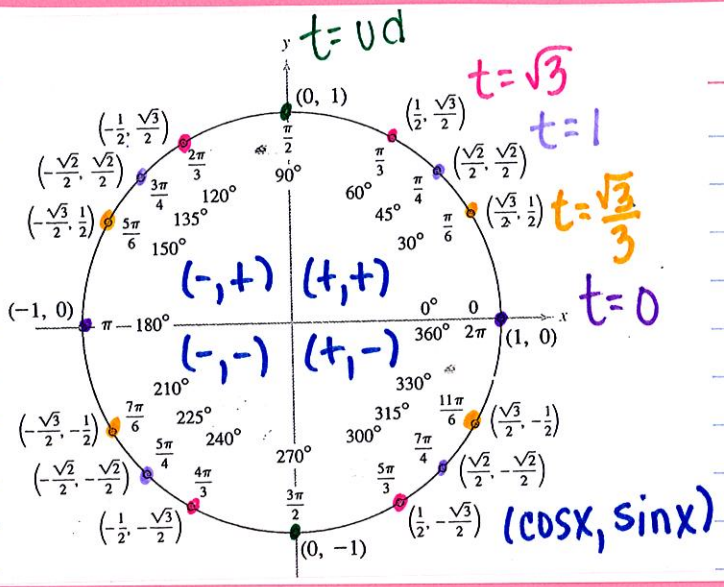
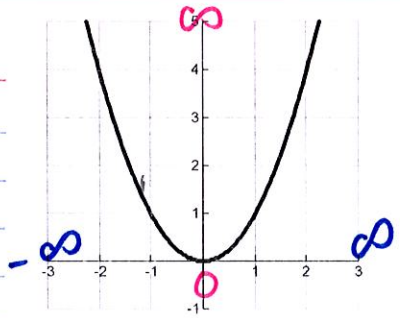
Unit Circle



What does the function $f(x) = x^2$ look like? What is the domain and range of $f(x) = x^2$? Is $f(x) = x^2$ even, odd, or neither?

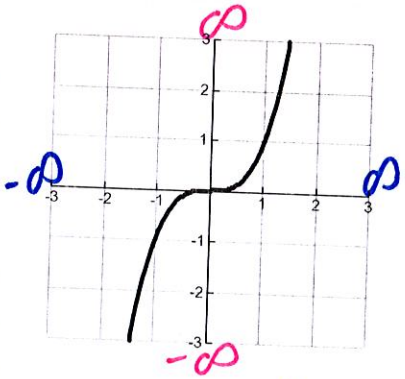


Domain $(-\infty, \infty)$

Range $[0, \infty)$

Even/odd Because symmetric to y-axis.

What does the function $f(x) = x^3$ look like? What is the domain and range of $f(x) = x^3$? Is $f(x) = x^3$ even, odd, or neither?

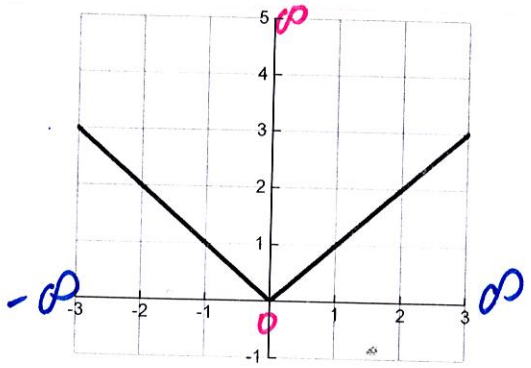


Domain $(-\infty, \infty)$

Range $(-\infty, \infty)$

Even/odd Because symmetric to x-axis & y-axis.

What does the function $f(x) = |x|$ look like? What is the domain and range of $f(x) = |x|$? Is $f(x) = |x|$ even, odd, or neither?



Domain $(-\infty, \infty)$
Range $[0, \infty)$

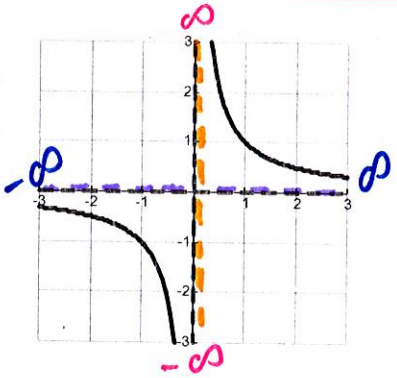
Even/Odd Symmetric to y-axis.

What does the function $f(x) = \sqrt{x}$ look like? What is the domain and range of $(x) = \sqrt{x}$? Is $f(x) = \sqrt{x}$ even, odd, or neither?

Domain $[0, \infty)$
Range $[0, \infty$

~~Even~~/odd
Neither

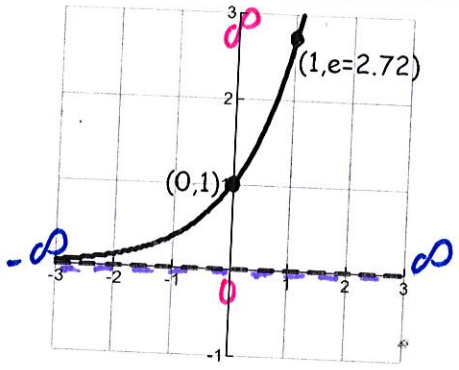
What does the function $f(x) = \frac{1}{x}$ look like? What is the domain and range of $f(x) = \frac{1}{x}$? What asymptotes does $f(x) = \frac{1}{x}$ have?



Domain $(-\infty, 0) \cup (0, \infty)$
Range $(-\infty, 0) \cup (0, \infty)$

Asy Vertical: $x = 0$
Horizontal: $y = 0$

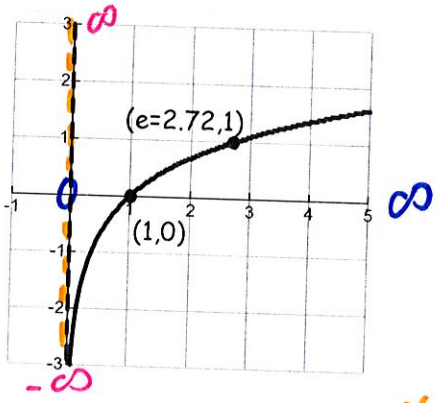
What does the function $f(x) = e^x$ look like?
What is the domain and range of $f(x) = e^x$?
What asymptotes does $f(x) = e^x$ have?



Domain $(-\infty, \infty)$
Range $(0, \infty)$

Asy Horizontal
$y = 0$

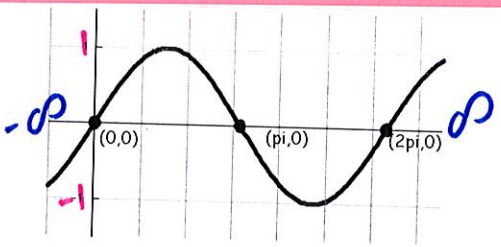
What does the function $f(x) = \ln(x)$ look like?
What is the domain and range of $f(x) = \ln(x)$?
What asymptotes does $f(x) = \ln(x)$ have?



Domain $(0, \infty)$
Range $(-\infty, \infty)$

Asy Vertical
$x = 0$

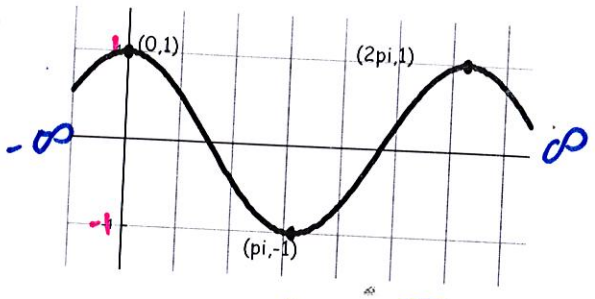
What does the function $f(x) = \sin(x)$ look like?
What is the domain and range of $f(x) = \sin(x)$?
What are the transformations of trig. functions



Domain: $(-\infty, \infty)$
Range: $[-1, 1]$
Even/Odd: Symmetric w/ origin.

$f(x) = a\sin(bx+c)+d$
amplitude: a
Vertical shift: d
Horizontal shift: $-\frac{c}{b}$
Period: $\frac{b}{2\pi}$ OR $\frac{b}{360^\circ}$

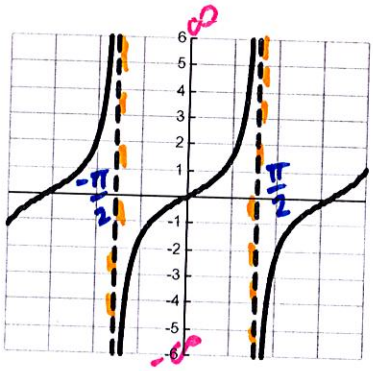
What does the function $f(x) = \cos(x)$ look like? What is the domain and range of $f(x) = \cos(x)$? Is $f(x) = \cos(x)$ even, odd, or neither?



Domain $(-\infty, \infty)$ Even/odd

Range $[-1, 1]$ Symmetric w/ Respect to y-axis

What does the function $f(x) = \tan(x)$ look like? What is the domain and range of $f(x) = \tan(x)$? What asymptotes does $f(x) = \tan(x)$ have?

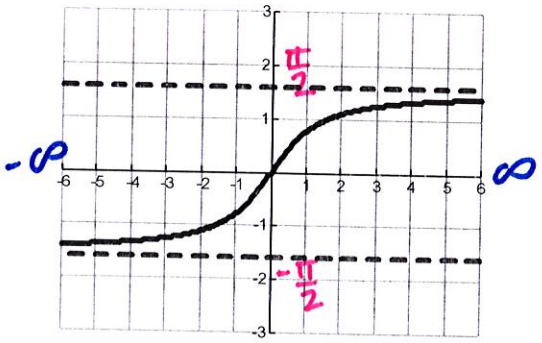


Domain $(-\frac{\pi}{2}, \frac{\pi}{2})$

Range $(-\infty, \infty)$

Asy Vertical $x = \frac{n\pi}{2}$ where n = odd integer

What does the function $f(x) = \tan^{-1}(x)$ look like? What is the domain and range of $f(x) = \tan^{-1}(x)$? What asymptotes does $f(x) = \tan^{-1}(x)$ have?



Domain $(-\infty, \infty)$

Range $(-\frac{\pi}{2}, \frac{\pi}{2})$

Asy Horizontal $y = \frac{\pi}{2}$ & $-\frac{\pi}{2}$.

What are the 3 Pythagorean Identities?

1. $\sin^2 x + \cos^2 x = 1$
   OR $\cos^2 x = 1 - \sin^2 x$
   $\sin^2 x = 1 - \cos^2 x$

2. $1 + \cot^2 x = \csc^2 x$
   OR $1 = \csc^2 x - \cot^2 x$
   $\cot^2 x = \csc^2 x - 1$

3. $\tan^2 x + 1 = \sec^2 x$
   $1 = \sec^2 x - \tan^2 x$
   $\tan^2 x = \sec^2 x - 1$

What is the double angle formula for $\sin(2x)$?

$\sin(2x) = 2\sin x \cos x$

The 3 formulas for $\cos(2x)$ are? Solve one for $\sin^2 x$ and one for $\cos^2 x$.

1.) $\cos(2x) = \cos^2 x - \sin^2 x$

2.) $\cos(2x) = 2\cos^2 x - 1$

$\cos^2 x = \frac{1}{2}[1 + \cos(2x)]$

3.) $\cos(2x) = 1 - 2\sin^2 x$

$\sin^2 x = \frac{1}{2}[1 - \cos(2x)]$

What is a piece-wise function?

Piecewise: $f(x)$ is given by different expressions on various intervals.

Ex $f(x) = \begin{cases} 2x & x < 2 \\ 3 & 2 \le x \le 5 \\ -x+5 & x > 5 \end{cases}$

How do you factor perfect cubes?

$A^3 + B^3 =$

$A^3 - B^3 =$

$A^3 + B^3 = (A+B)(A^2 - AB + B^2)$

$A^3 - B^3 = (A-B)(A^2 + AB + B^2)$

P Positive
A Always
O Opposite
S Same

Ex Factor $8m^6 + 27q^9$

$(2m^2)^3 + (3q^3)^3$

$(2m^2 + 3q^3)(4m^4 - 6m^2q^3 + 9q^6)$

What are the rules of exponents?

$x^a \cdot x^b =$ ___ $x^{-a} =$ ___

$\frac{x^a}{x^b} =$ ___ $x^0 =$ ___

$x^a \cdot x^b = x^{a+b}$

$\frac{x^a}{x^b} = x^{a-b}$

$x^{-a} = \frac{1}{x^a}$

$x^0 = 1$