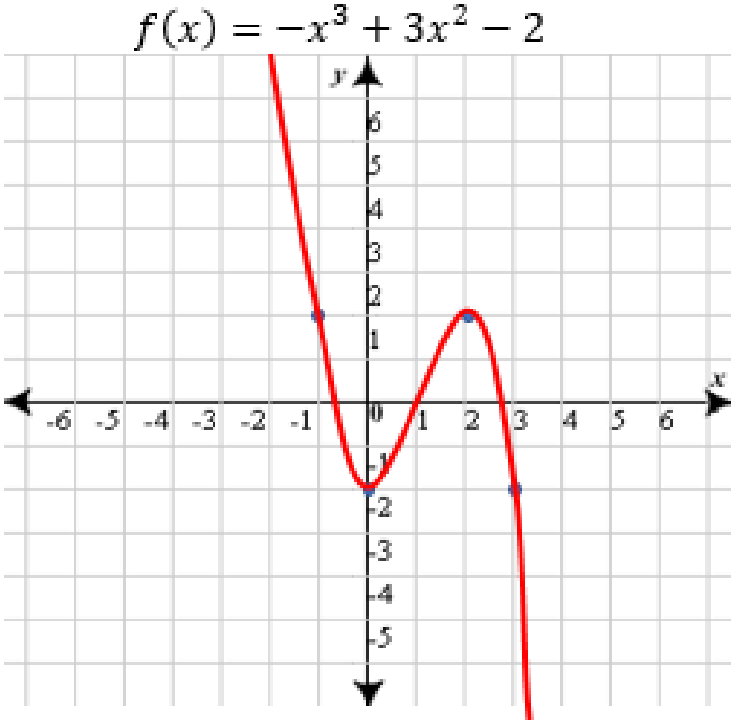
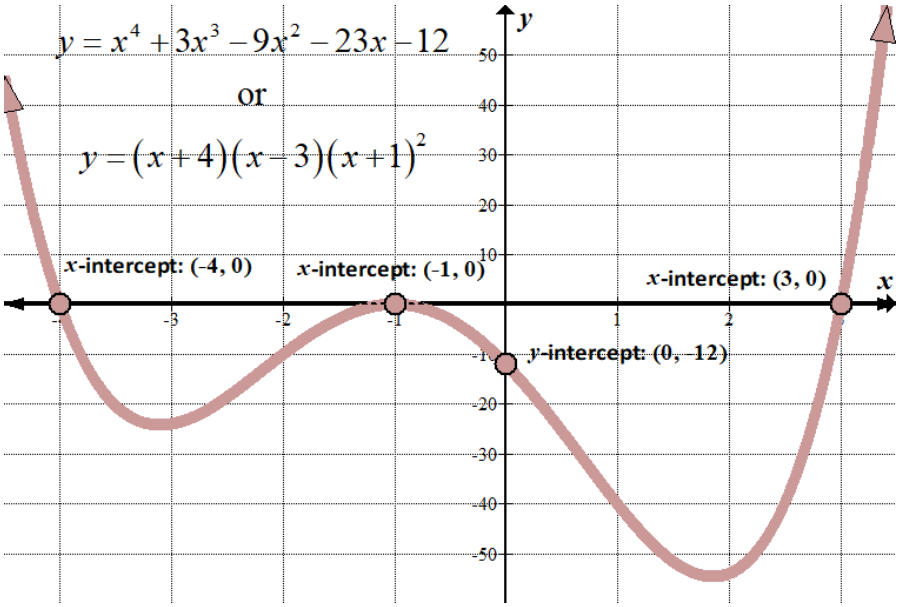
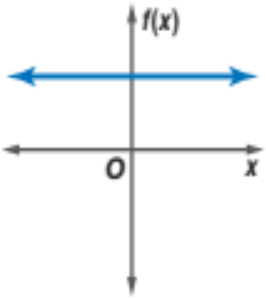
1. Polynomials



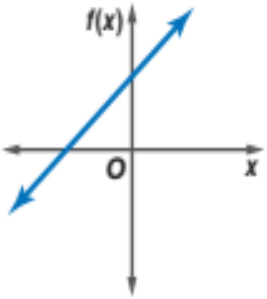


2. General types of polynomials

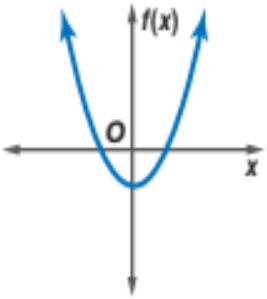
Constant function
Degree 0



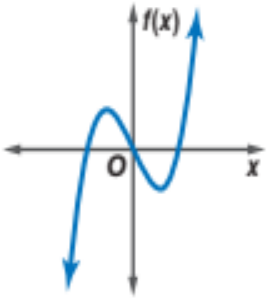
Linear function
Degree 1



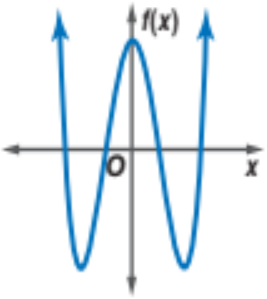
Quadratic function
Degree 2



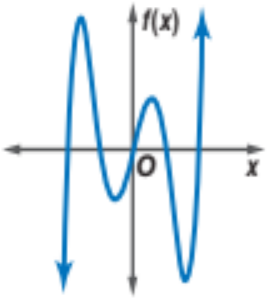
Cubic function
Degree 3

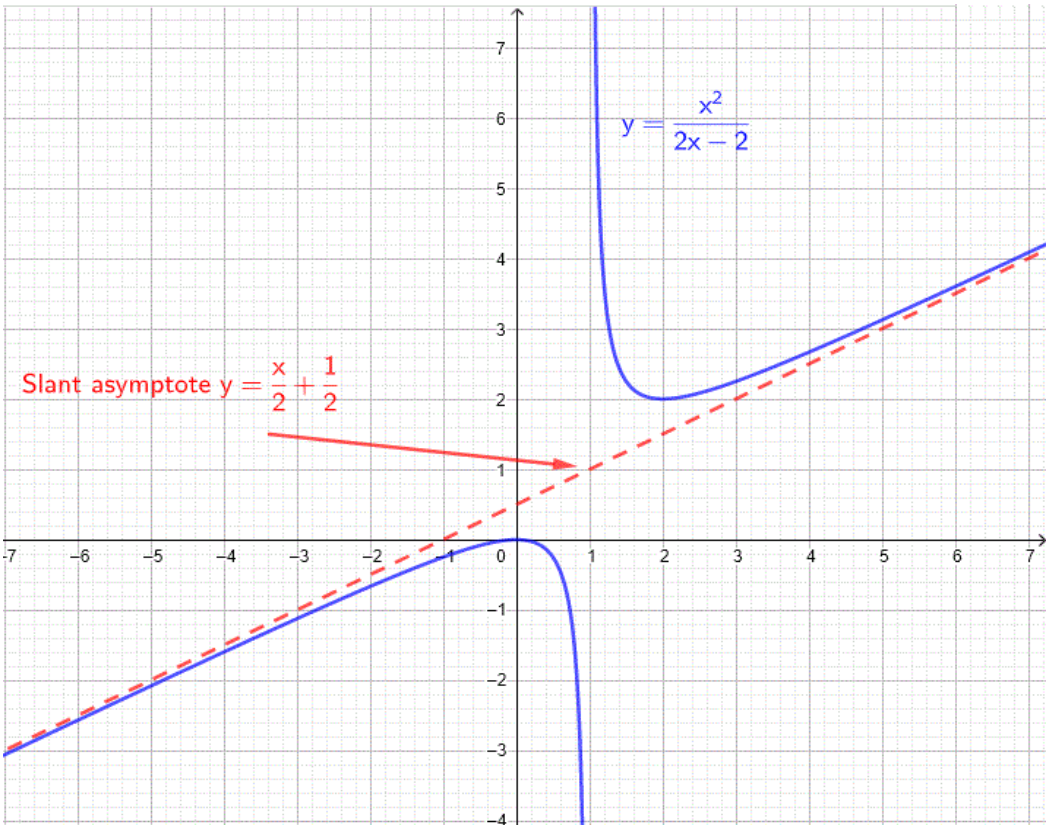


Quartic function
Degree 4

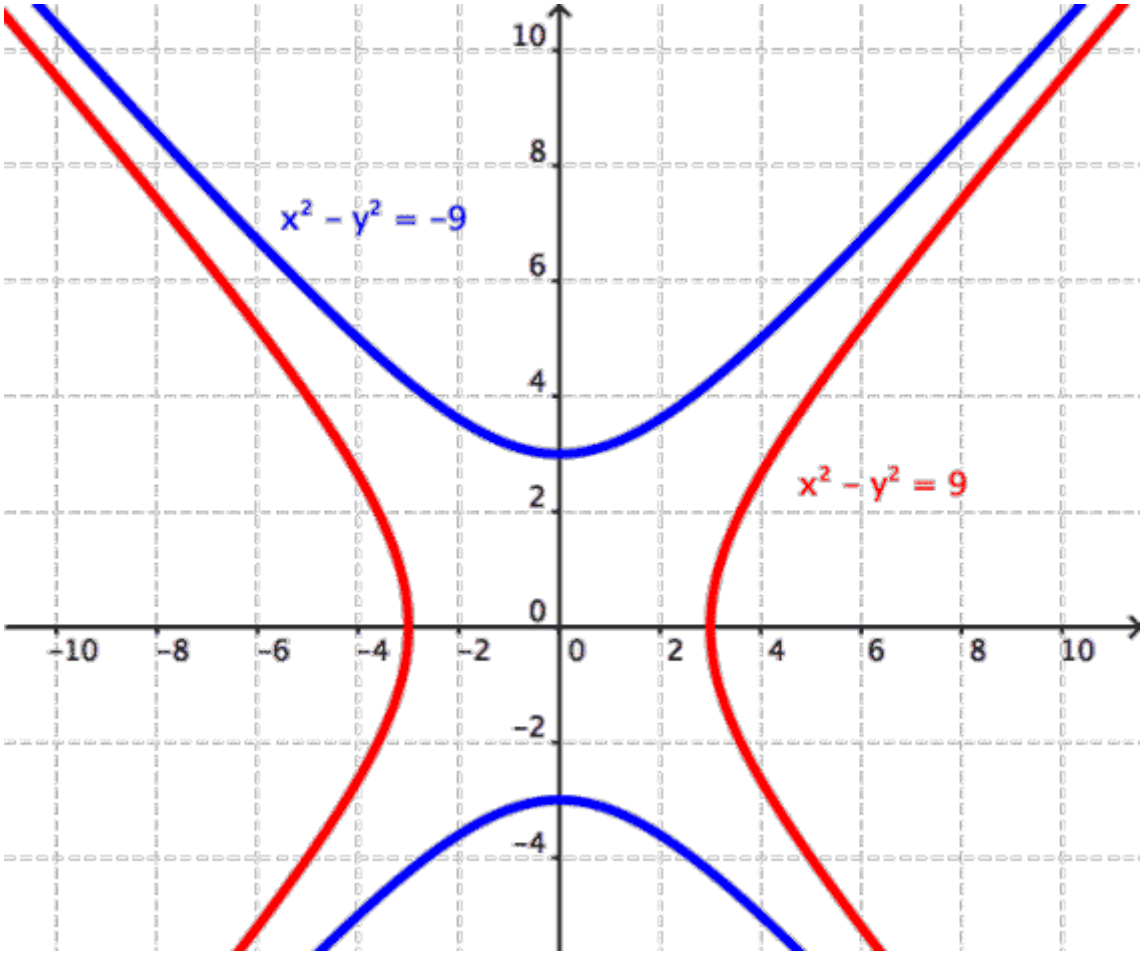


Quintic function
Degree 5





3. Rational Functions



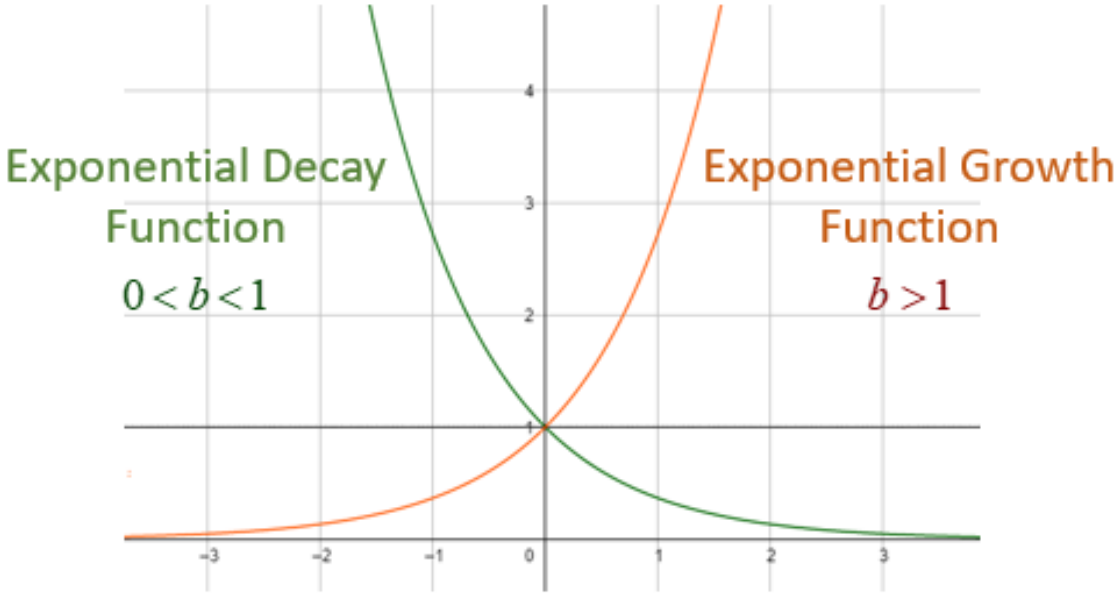
4. Algebraic functions

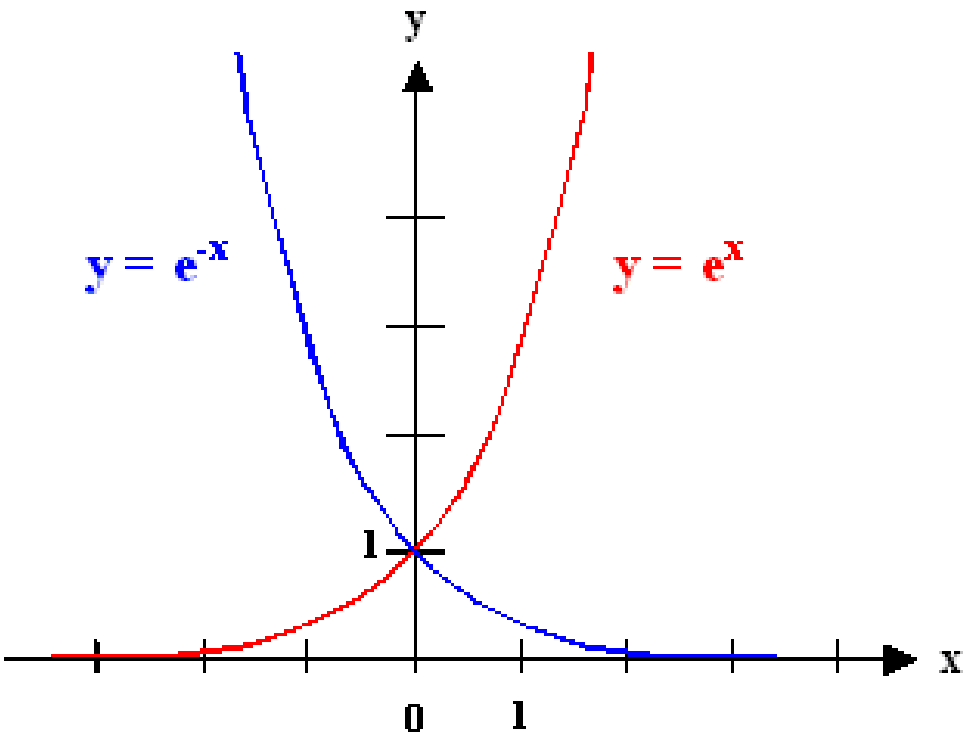
Exponential Growth and Decay Functions

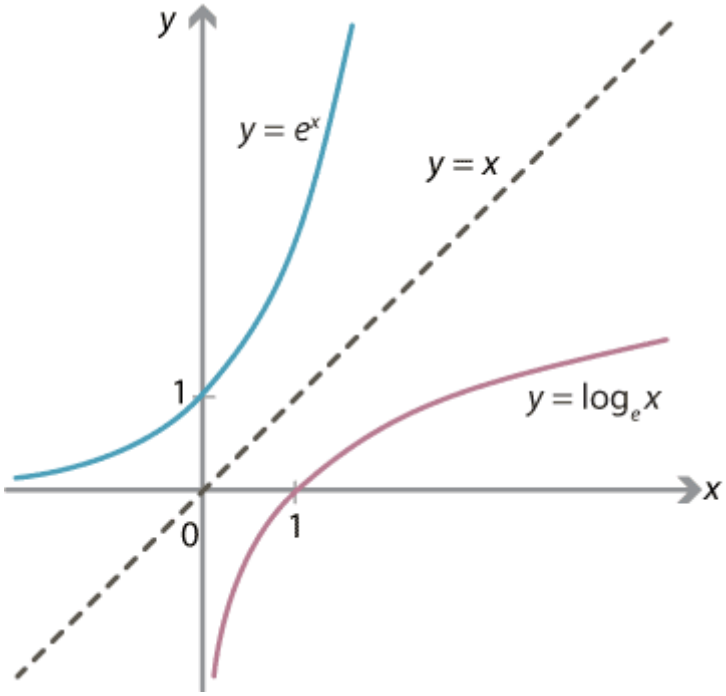
An exponential function f is given by

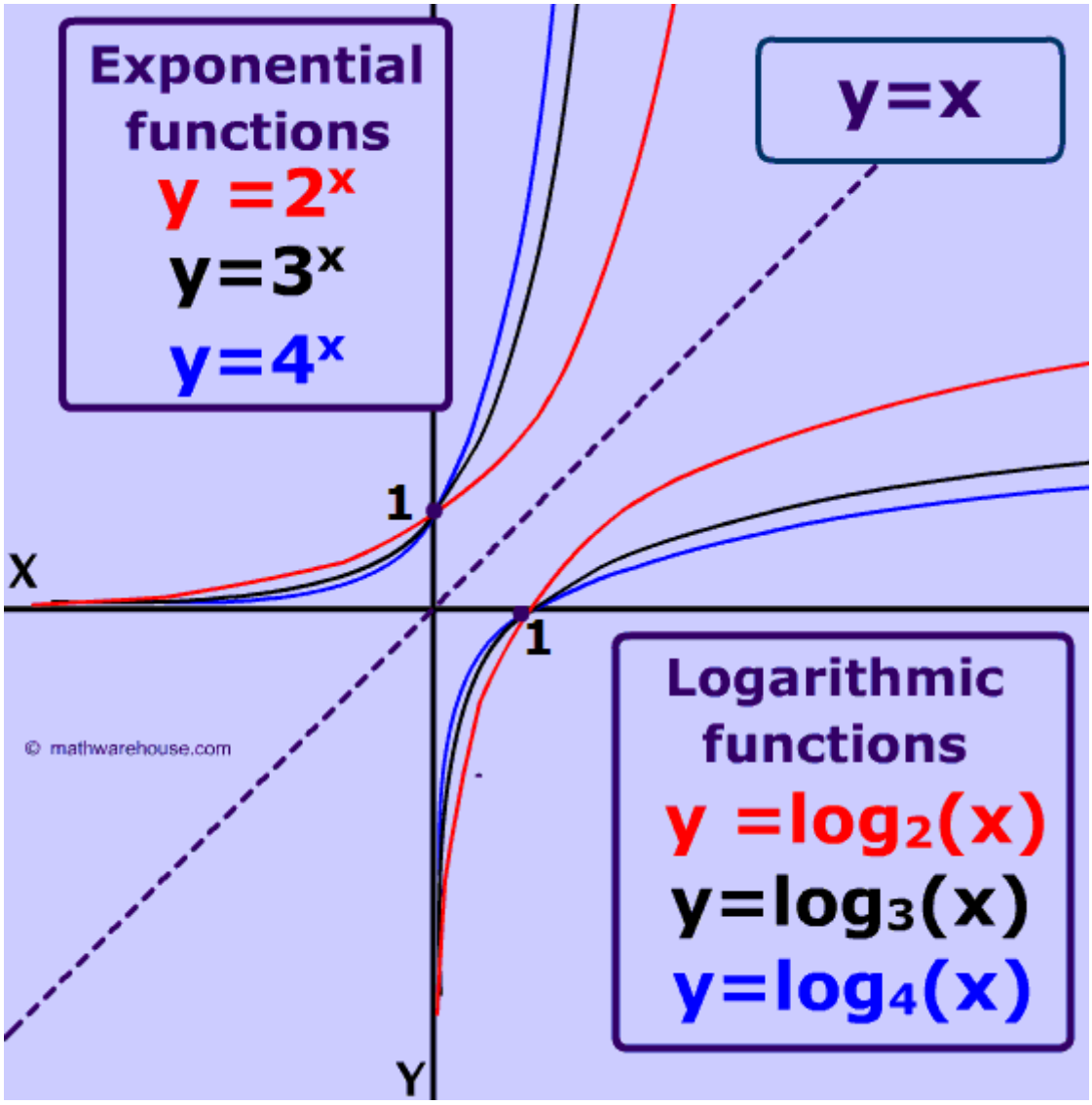
$$f(x) = b^x$$

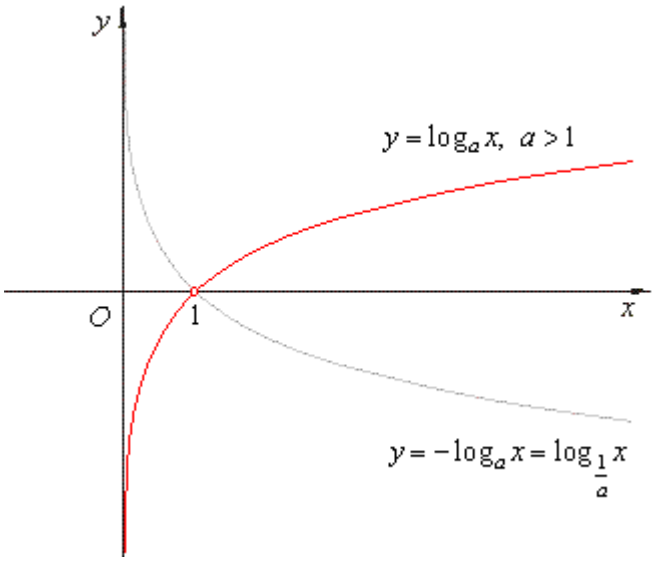
where x is any real number, b > 0, and b ≠ 1.

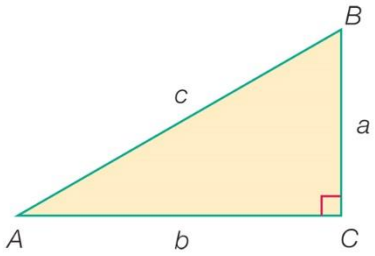



y
y = e-x
y = ex
1
x
0
1


y
y = e^x
y = x
1
y = log_e x
x
0
1


Exponential functions
y =2x
y=3x
y=4x
y=x
1
X
1
Y
© mathwarehouse.com
Logarithmic functions
y =log2(x)
y=log3(x)
y=log4(x)

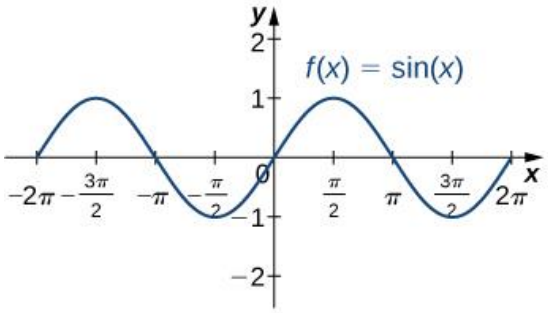

y
y = log_a x, a > 1
O
1
x
y = −log_a x = log_{1/a} x



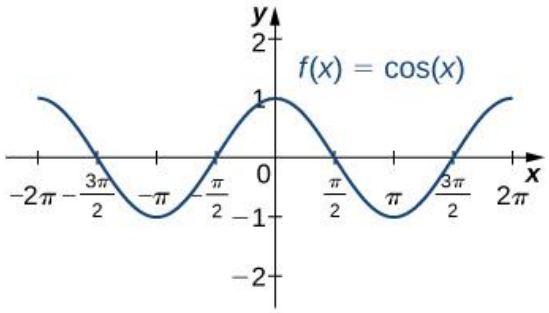
$$\sin A = \frac{a}{c} = \frac{\text{side opposite}}{\text{hypotenuse}} \qquad \csc A = \frac{c}{a} = \frac{\text{hypotenuse}}{\text{side opposite}}$$

$$\cos A = \frac{b}{c} = \frac{\text{side adjacent}}{\text{hypotenuse}} \qquad \sec A = \frac{c}{b} = \frac{\text{hypotenuse}}{\text{side adjacent}}$$

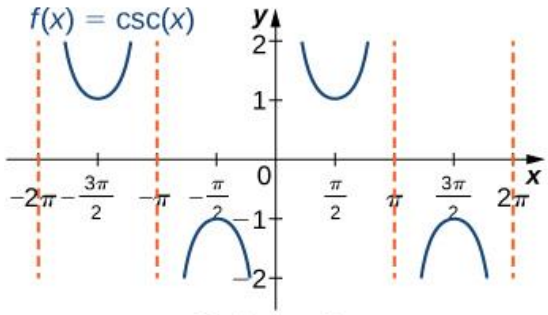
$$\tan A = \frac{a}{b} = \frac{\text{side opposite}}{\text{side adjacent}} \qquad \cot A = \frac{b}{a} = \frac{\text{side adjacent}}{\text{side opposite}}$$



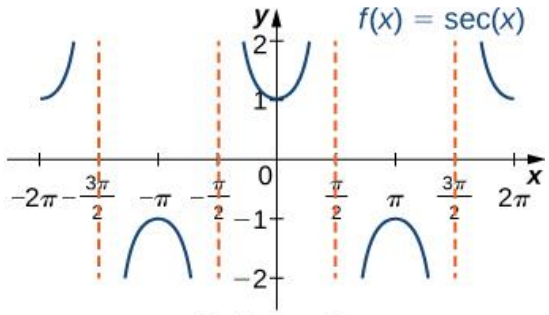
Period = 2π



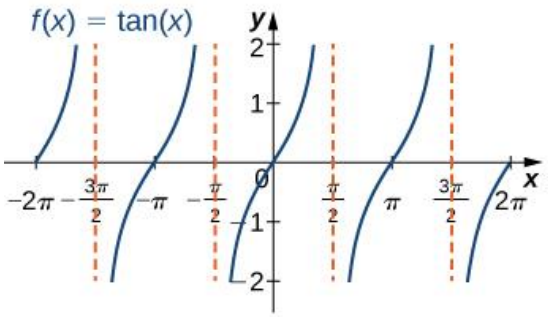
Period = 2π



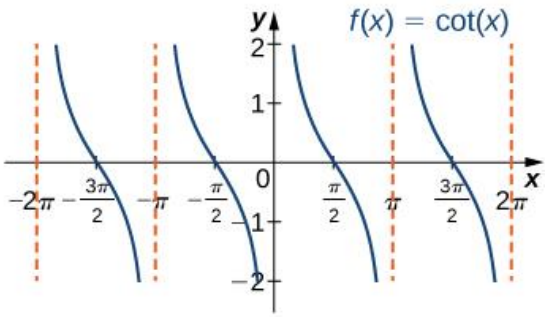
Period = 2π



Period = 2π



Period = π

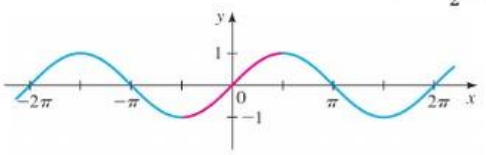


Period = π

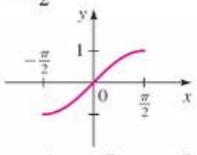
Section 5.5 Inverse Trigonometric Functions and Their Graphs

DEFINITION: The **inverse sine function,** denoted by $\sin^{-1} x$ (or $\arcsin x$), is defined to be the inverse of the restricted sine function

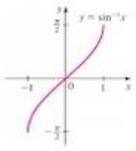
$$\sin x, \quad -\frac{\pi}{2} \le x \le \frac{\pi}{2}$$



$y = \sin x$

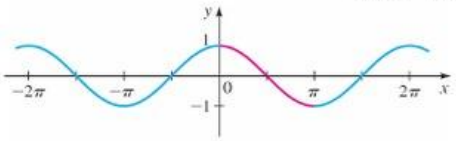


$y = \sin x, \ -\frac{\pi}{2} \le x \le \frac{\pi}{2}$

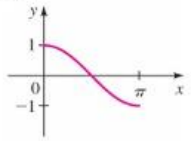


DEFINITION: The **inverse cosine function,** denoted by $\cos^{-1} x$ (or $\arccos x$), is defined to be the inverse of the restricted cosine function

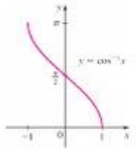
$$\cos x, \quad 0 \le x \le \pi$$



$y = \cos x$

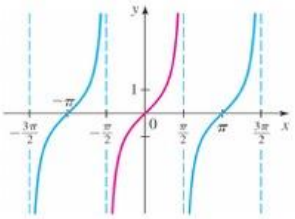


$y = \cos x, \ 0 \le x \le \pi$

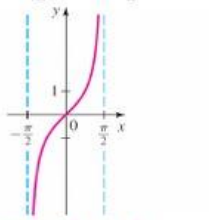


DEFINITION: The **inverse tangent function,** denoted by $\tan^{-1} x$ (or $\arctan x$), is defined to be the inverse of the restricted tangent function

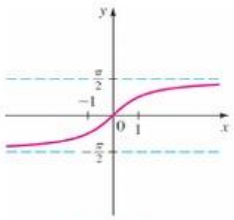
$$\tan x, \quad -\frac{\pi}{2} < x < \frac{\pi}{2}$$



$y = \tan x$



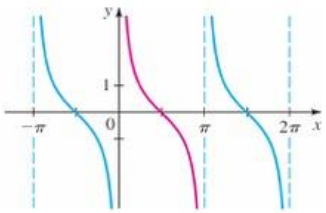
$y = \tan x, \ -\frac{\pi}{2} < x < \frac{\pi}{2}$



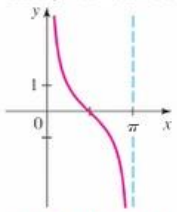
$y = \tan^{-1} x$

DEFINITION: The **inverse cotangent function,** denoted by $\cot^{-1} x$ (or $\operatorname{arccot} x$), is defined to be the inverse of the restricted cotangent function

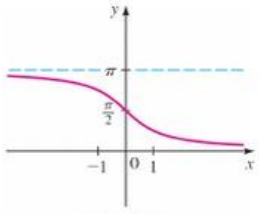
$$\cot x, \quad 0 < x < \pi$$



$y = \cot x$

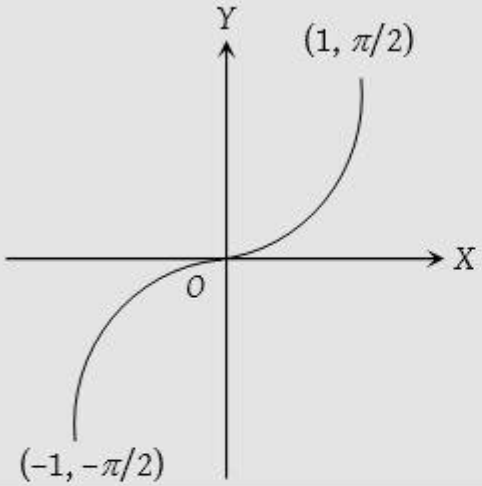


$y = \cot x, \ 0 < x < \pi$

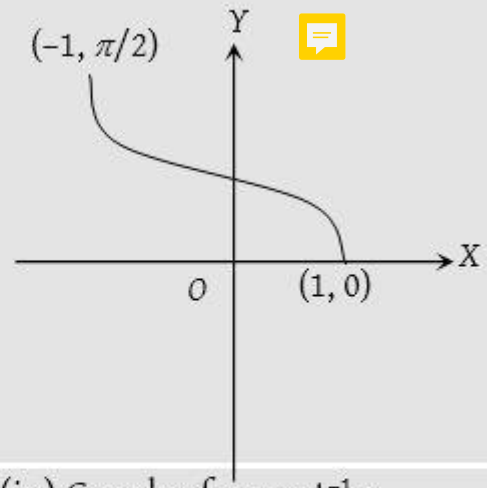


$y = \cot^{-1} x$

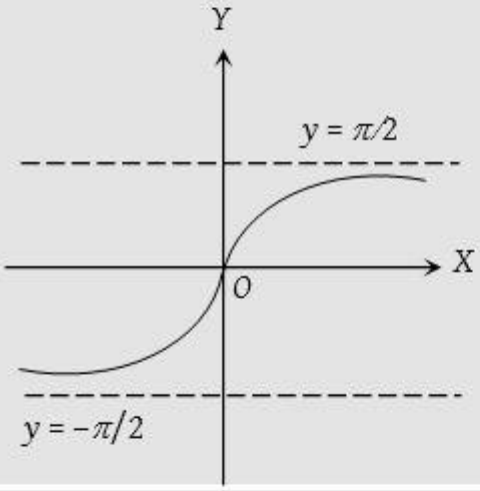
(i) Graph of $y = \sin^{-1}x$



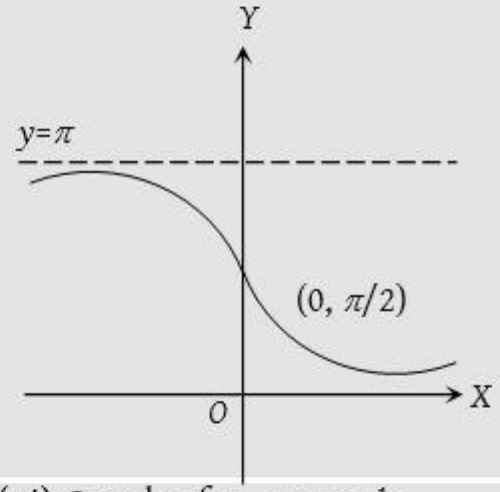
(ii) Graph of $y = \cos^{-1}x$



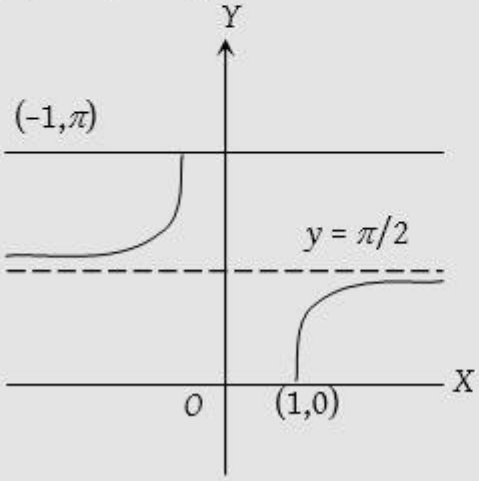
(iii) Graph of $y = \tan^{-1}x$



(iv) Graph of $y = \cot^{-1}x$



(v) Graph of $y = \sec^{-1}x$



(vi) Graph of $y = \operatorname{cosec}^{-1}x$