

1.5 and 1.6 Logarithmic and Trigonometric Functions

Relationship between Exponential and Logarithmic Functions

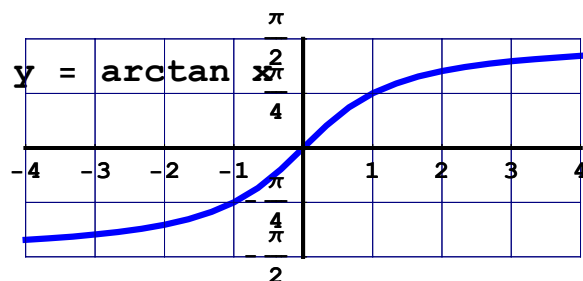
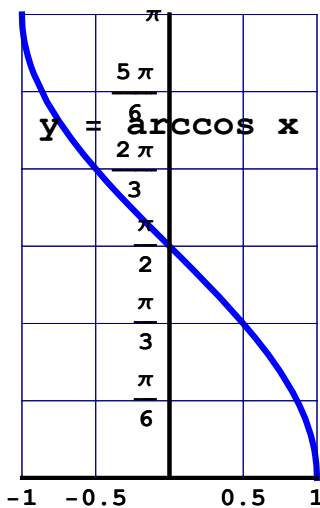
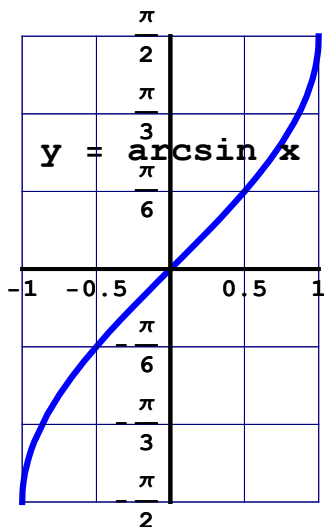
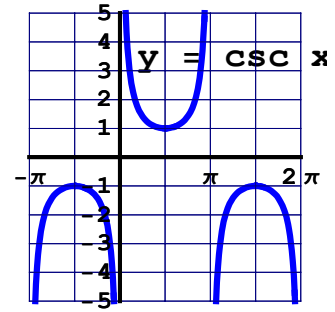
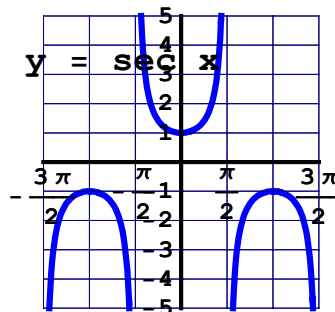
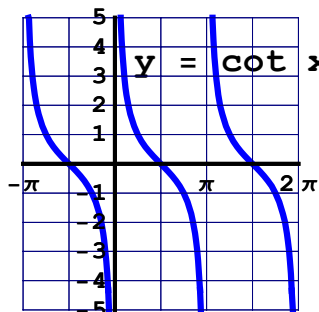
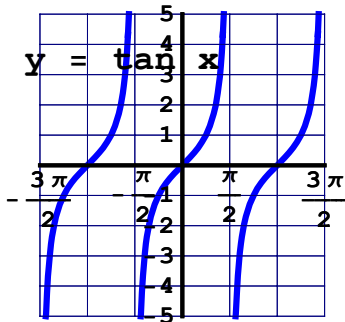
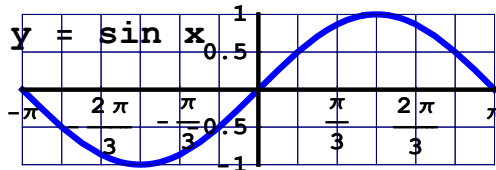
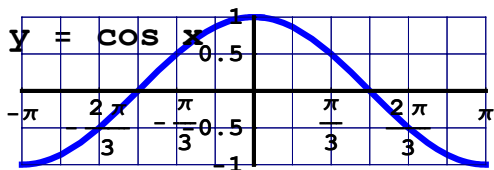
- (1) $y = \log_a x$ is the inverse of $y = a^x$, where $a > 0$, $a \neq 1$
 (2) $a^{\log_a x} = x$ and $\log_a(a^x) = x$, where $a > 1$, $x > 0$

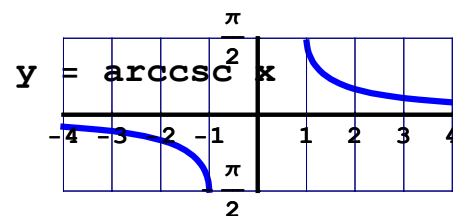
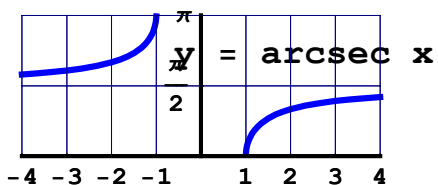
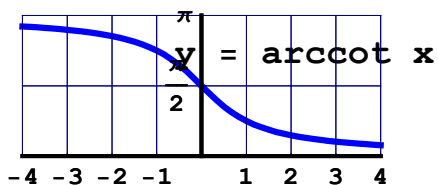
Rules for Logarithms

Assuming that $x > 0$ and $y > 0$,

- (1) $\log_a(xy) = \log_a x + \log_a y$ (2) $\log_a\left(\frac{x}{y}\right) = \log_a x - \log_a y$ (3) $\log_a(x^y) = y \log_a x$
 (4) $\log_a b = \frac{\log_c b}{\log_c a}$ (where $a > 0$, $b > 0$, $c > 0$, $a \neq 1$, $b \neq 1$, $c \neq 1$)

Trigonometric Functions and their Inverses

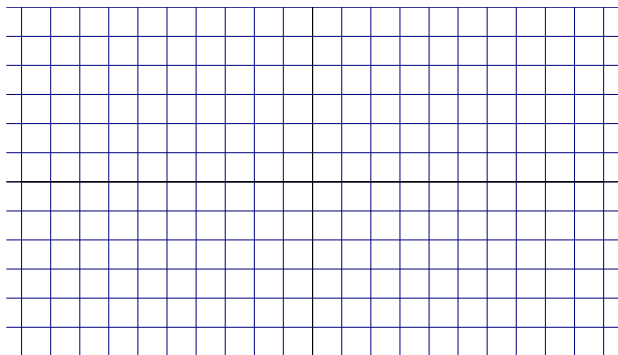




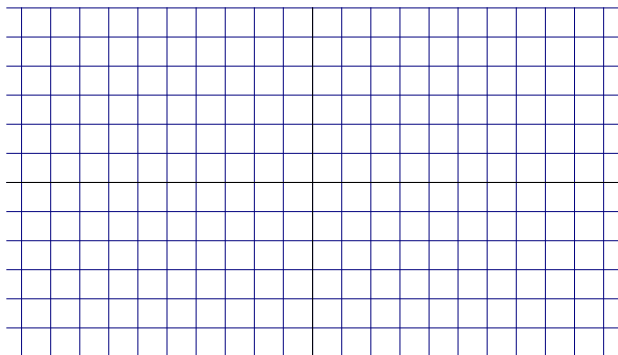
Arc Length for a Circle

$$L = \theta r$$

1. Graph the function $y = -2\log_4(x + 3) - 1$



2. Graph the function $y = \ln(2 - x) + 3$



3. Solve the equation $2^{3x} - 5 = 0$

4. Solve the equation $3^x - 5 = -6(3^{-x})$

5. Solve for y if $\ln(x + 2) - 3 = \ln 4 - \ln(y + 1)$

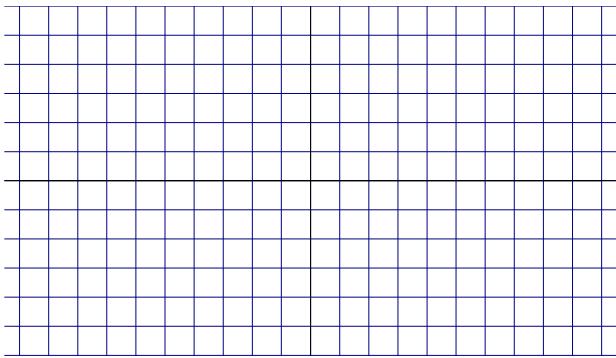
For problems 6 and 7, find the measure of the angle in radians and degrees

6. $\cot^{-1}(-\sqrt{3})$

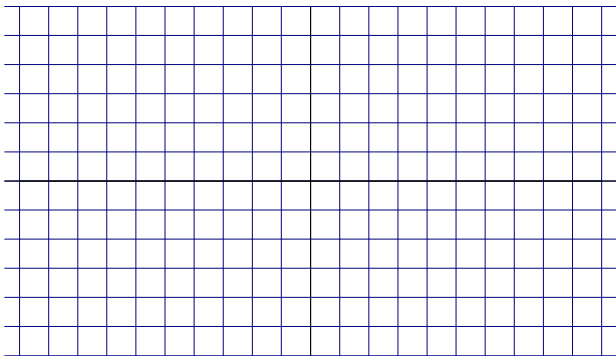
7. $\csc^{-1}\left(\frac{-2}{\sqrt{3}}\right)$

For problems 8 – 10, graph the function, and find the (a) period, and (b) amplitude

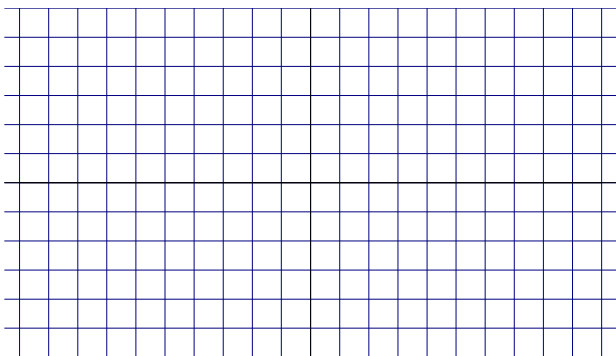
8. $y = -2\sin\left(3x - \frac{3\pi}{4}\right) + 1$



9. $y = \frac{1}{2}\sec(2x + \pi) - 1$



10. $y = -\cot\left(2x - \frac{\pi}{2}\right) + 2$



11. Find the values of the six trigonometric functions if $\theta = \sec^{-1}\left(\frac{-13}{5}\right)$