

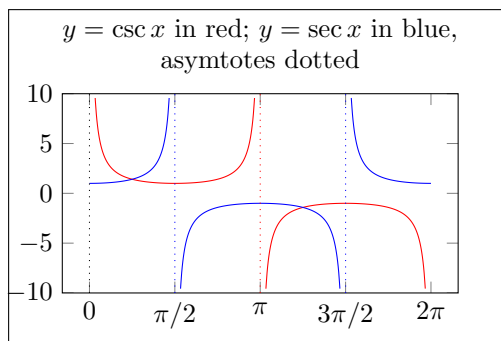
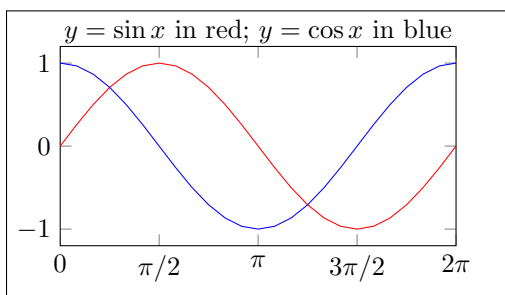
Square Roots $\sqrt{x^6} = x^3 $ $\sqrt{x^8} = x^4$ $\sqrt{x^7} = x^3\sqrt{x}$	Absolute Value Inequalities $ x < c \quad -c < x < c$ $ x > c \quad x < -c \text{ or } c < x$	Distance Formula $A(x_1, y_2) \text{ and } B(x_2, y_2)$ $d(A, B) = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$	Midpoint Formula $A(x_1, y_2) \text{ and } B(x_2, y_2)$ $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$				
Equation of a Circle $(x-h)^2 + (y-k)^2 = r^2$	Point-Slope Form $y - y_1 = m(x - x_1)$	Standard Form $Ax + By + C = 0$	Positive Trigonometric Functions I-All II-sin III-tan IV-cos		Law of Cosines $a^2 = b^2 + c^2 - 2bc \cdot \cos A$		
Joint Variation If z is varies jointly as x and y , $z = kxy$	Perpendicular Lines $m_2 = -\frac{1}{m_1}$	Average Rate of Change $\text{ARoC} = \frac{\text{y change}}{\text{x change}} = \frac{f(x_2) - f(x_1)}{x_2 - x_1}$	Difference of Cubes $a^3 + b^3 = (a+b)(a^2 - ab + b^2)$ $a^3 - b^3 = (a-b)(a^2 + ab + b^2)$		Standard Form of a Quadratic Function $f(x) = a(x - h)^2 + k$		
Vertical Shifts of Graphs Suppose $c > 0$. Graph $y = f(x) + c$ by shifting $y = f(x)$ up c . Graph $y = f(x) - c$ by shifting $y = f(x)$ down c .			Horizontal Shifts of Graphs Suppose $c > 0$. Graph $y = f(x - c)$ by shifting $y = f(x)$ right c . Graph $y = f(x + c)$ by shifting $y = f(x)$ left c .		Definition of Log if $a^x = y$, $\log_a y = x$	Arc Length $s = r\theta$	
Reflecting Graphs Graph $y = -f(x)$ by reflecting $y = f(x)$ in the x -axis. Graph $y = f(-x)$ by reflecting $y = f(x)$ in the y -axis.			Vertical Stretching of Graphs To graph $y = cf(x)$, graph $y = f(x)$, then if $c > 1$ stretch vertically a by factor of c if $0 < c < 1$ shrink vertically a by factor of c			Inverse Variation If y is inversly proportional to x , $y = \frac{k}{x}$	
Horizontal Stretching of Graphs To graph $y = f(cx)$, graph $y = f(x)$, then if $c > 1$ shrink horizontally by a factor of $\frac{1}{c}$ if $0 < c < 1$ stretch horizontally by a factor of $\frac{1}{c}$			Even and Odd Functions if $f(-x) = f(x)$ $f(x)$ is even if $f(-x) = -f(x)$ $f(x)$ is odd			Heron's Formula $A = \sqrt{s(s-a)(s-b)(s-c)}$	
Min or Max of a Quadratic Function $f(x) = x(x - h)^2 + k \quad f(h) = k$ $f(x) = ax^2 + bx + c \quad f(-\frac{b}{2a})$		Change of Base $\log_b m = \frac{\log m}{\log b}$	Completing the Square With a quadratic in form $ax^2 + bx = c$ $(\frac{1}{2} \cdot b)^2 = c$	Hidden quadratic 1 $x^{-3/2} + 2x^{-1/2} + x^{1/2}$ $x^{-3/2}(1 + 2x + x^2)$ $x^{-3/2}(1 + x)^2$	Hidden quadratic 2 $e^{2x} + 2e^x + 1$ $(e^x + 1)^2$		
Permutations $p(x, y) = \frac{x!}{(x - y)!}$	Choose Formula $C(x, y) = \binom{x}{y} = \frac{x!}{y!(x - y)!}$	Law of Sines $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$		Degrees to Radians $\frac{A \cdot \pi}{180} = \theta$	Remainder Theorem If $P(x) \div (x - c)$, the remainder = $P(c)$.		
SOH-CAH-TOA $\sin = \frac{\text{opp}}{\text{hyp}} \quad \cos = \frac{\text{adj}}{\text{hyp}} \quad \tan = \frac{\text{opp}}{\text{adj}}$			Sector Area $A = \frac{1}{2}r^2\theta$	Direct Variation If y is directly proportional to x , $y = kx$	Population Growth n is population size, r is relative growth rate, t is time $n = n_0e^{rt}$	Area of Δ $A = ab \cdot \frac{1}{2} \sin C$	
Properties of logs $(\log_a b)(\log_c d) = (\log_a d)(\log_c b)$ $\log m + \log n = \log mn$ $\log m - \log n = \log \frac{m}{n}$ $m \log n = \log n^m$			Two-intercept form $\frac{x}{a} + \frac{y}{b} = 1$		Quadratic Formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$		Slope-Intercept Form $y = mx + b$
i raised to a power $i^1 = i$ $i^2 = -1$ $i^3 = -i$ $i^4 = 1$...			Complex numbers $\frac{1}{a + bi} = a - bi$ $ a + bi = \sqrt{(a + bi)(a - bi)}$				

<p>Algebra of Functions</p> <p>Let f and g be functions with domains A and B.</p> <p>$(f + g)(x) = f(x) + g(x)$ Domain $A \cap B$</p> <p>$(f - g)(x) = f(x) - g(x)$ Domain $A \cap B$</p> <p>$(fg)(x) = f(x)g(x)$ Domain $A \cap B$</p> <p>$\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)}$ Domain $\{x \in A \cap B \mid g(x) \neq 0\}$</p> <p>$(f \circ g)(x) = f(g(x))$ Domain $\{x \in B \mid g(x) \in A\}$</p>	<p>Polynomial Synthetic Division</p> $(x^3 + x^2 - 1) \div (x + 2)$ $\begin{array}{r rrrr} -2 & 1 & 1 & 0 & -1 \\ & & -2 & 2 & -4 \\ \hline & 1 & -1 & 2 & -5 \end{array}$ <p>Result is $x^2 - x + 2 - \frac{5}{x+2}$</p>	<p>Polynomial Long Division</p> $\begin{array}{r} x^2 - x + 2 \\ x+2 \overline{) x^3 + x^2 - 1} \\ \underline{-(x^3 + 2x^2)} \\ -x^2 - 1 \\ \underline{-(x^2 + 2x)} \\ 2x - 1 \end{array}$
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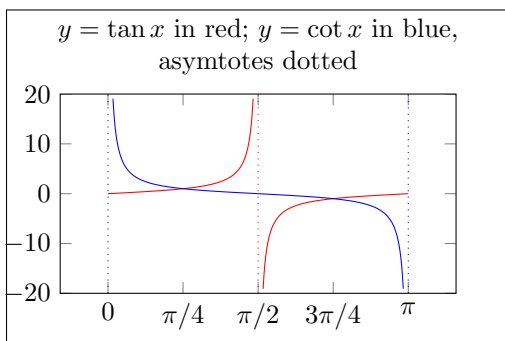
<p>Rational Roots Theorem</p> $2x^3 + 2x^2 - 3x - 6$ <p>$\pm 1, \pm 2 \quad \pm 1, \pm 2, \pm 3, \pm 6$</p> <p>Possible rational roots:</p> $\pm 1, \pm \frac{1}{2}, \pm 2, \pm 3, \pm \frac{3}{2}, \pm 6$	<p>Decartes' Rule of Signs</p> <p>Count num. of sign changes</p> $P(x) = 3x^6 + 4x^5 + 3x^3 - x - 3$ <p>1 positive real root</p> $P(-x) = 3x^6 - 4x^5 - 3x^3 + x - 3$ <p>1 or 3 negative real roots</p>	<p>Logarithm Formulas</p> <p>$\log(m \cdot n) = \log m + \log n$</p> <p>$\log\left(\frac{m}{n}\right) = \log m - \log n$</p> <p>$\log(m^n) = n \cdot \log m$</p> <p>$\log_b b^x = x = b^{\log_b x}$</p>	<p>Trigonometric Reciprocals</p> <p>$\cot = \frac{1}{\tan}$</p> <p>$\csc = \frac{1}{\sin}$</p> <p>$\sec = \frac{1}{\cos}$</p>
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<p>Horizontal Asymptotes</p> <p>When degree of numerator is same as degree of denominator</p> $y = \frac{2x^2 - 4x + 5}{x^2 - 2x + 1}$ Original Equation $= \frac{2x^2}{x^2}$ $x \rightarrow \infty$, other terms \rightarrow tiny $= 2$ Cancel, horizontal asymptote <p>If degree of denominator is greater, 0</p>	<p>Slant Asymptotes</p> <p>When degree of numerator is one greater than degree of denominator</p> $y = \frac{x^2 - 4x - 5}{x - 3}$ Original Equation $= x - 1 - \frac{8}{x - 3}$ Divide $= x - 1$ $x \rightarrow \infty$, other terms \rightarrow tiny
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<p>Vertical Asymptotes</p> $y = \frac{2x^2 - 4x + 5}{x^2 - 2x + 1}$ Original Equation $= \frac{2x^2 - 4x + 5}{(2x - 1)(x + 2)}$ Factor demoniator $x = \frac{1}{2}$ or $x = -2$ Impossible	<p>End Behavior</p> <p>$y = x^n$ $y = -x^n$</p> <p>n is even n is even</p> <p>$y = x^n$ $y = -x^n$</p> <p>n is odd n is odd</p>	<p>Trig Identities</p> <p>$\sin^2 + \cos^2 = 1$</p> <p>$\tan^2 + 1 = \sec^2$</p> <p>$1 + \cot^2 = \csc^2$</p>
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<p>$\sin/\cos/\csc/\sec$ Graph Properties</p> <p>If in form:</p> $y = a \sin k(x - b)$ <p>amplitude a, period $2\pi/k$, phase shift b</p>



<p>\tan/\cot Graph Properties</p> <p>If in form:</p> $y = a \sin k(x - b)$ <p>amplitude a, period π/k, phase shift b</p>
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