Pre-Calculus Cheat Sheet Cheat Sheet
by fgabe358 via cheatography.com/197565/cs/41665/

Properties of Square Roots

$\sqrt{a}\cdot\sqrt{b}=\sqrt{ab}$

$\frac{\sqrt{a}}{\sqrt{b}}=\sqrt{\frac{a}{b}}$

$(\sqrt{a})^m=\sqrt{a^m}$

$\sqrt{ab}=\sqrt{|a|}\cdot\sqrt{|b|}$

$\sqrt{\frac{a}{b}}=\frac{\sqrt{|a|}}{\sqrt{|b|}}$

$\sqrt{a^m}=(\sqrt{|a|})^m$

$\sqrt[n]{a}=\sqrt[nk]{a^k}$

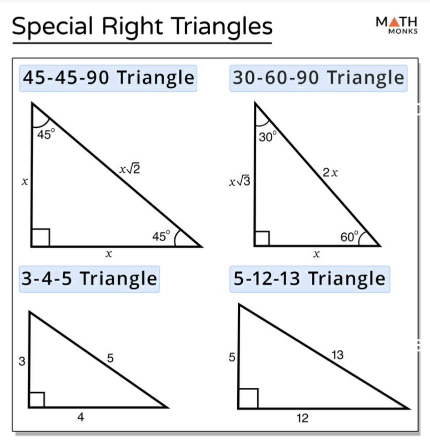
$\sqrt[n]{a}\cdot\sqrt[n]{b}=\sqrt[n]{a\cdot b}$

$\frac{\sqrt[n]{a}}{\sqrt[n]{b}}=\sqrt[n]{\frac{a}{b}}$

$(\sqrt[n]{a})^m=\sqrt[n]{a^m}$

$\sqrt[m]{\sqrt[n]{a}}=\sqrt[nm]{a}$

Side Ratios



Conversion

Radians = $\left(\frac{\pi}{180^\circ}\right)$ × degrees

Degrees = $\left(\frac{180^\circ}{\pi}\right)$ × radians

Compound Interest

Formula

$$A=P(1+\frac{r}{n})^{nt}$$

A = final amount
P = initial principal balance
r = interest rate
n = number of times interest applied per time period
t = number of time periods elapsed

Laws of Exponents and Logarithms

Exponent Rules	Logarithm Rules
$a^m \cdot a^n = a^{m+n}$	$\log(mn)=\log m+\log n$
$\frac{a^m}{a^n}=a^{m-n}$	$\log\left(\frac{m}{n}\right)=\log m-\log n$
$(a^m)^n=a^{mn}$	$\log m^n = n\log m$

...ge of Base Formula

Change of Base Formula

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$\log_b a=\frac{\log_c a}{\log_c b}$

(OR)

$\log_b a.\log_c b=\log_c a$

...nometric Functions

	Functions	Domain	Range
(i)	sine	R	[−1, 1]
(ii)	cosine	R	[−1, 1]
(iii)	tangent	$R-\{x : x=(2n+1)\frac{\pi}{2}, n\in Z)$	R
(iv)	cosecant	$R-\{x : x=n\pi, n\in Z\}$	R − [−1, 1]
(v)	secant	$R-\{x : x=(2n+1)\frac{\pi}{2}, n\in Z\}$	R − [−1, 1]
(vi)	cotangent	$R-\{x : x=n\pi, n\in Z\}$	R

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Function	Domain	Range
y = arcsin(x)	$-1 \le x \le 1$	$-\pi/2 \le y \le \pi/2$
y = arccos(x)	$-1 \le x \le 1$	$0 \le y \le \pi$
y = arctan(x)	$-\infty < x < \infty$	$-\pi/2 < y < \pi/2$
y = arccsc(x)	$x \le -1$ or $x \ge 1$	$-\pi/2 \le y \le \pi/2, y \ne 0$
y = arcsec(x)	$x \le -1$ or $x \ge 1$	$0 \le y \le \pi, y \ne \pi/2$
y = arccot(x)	$-\infty < x < \infty$	$0 < y < \pi$

Continuous Interest

Formula

$$P(t)=P_0e^{rt}$$

$P(t)$ = value at time t
P_0 = original principal sum
r = nominal annual interest rate
t = length of time the interest is applied

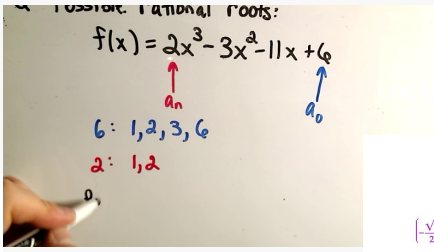
Reference Angle

Quadrant I	given angle
Quadrant II	180 - given angle
Quadrant III	given angle - 180
Quadrant IV	360 - given angle

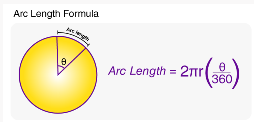
Find an equation of a line that:

passes through two points	y = mx + b
that is parallel to one another	isolate b
that is perpendicular to one another	solve for x

Rational Root Theorem



Arc Length



Sector Area

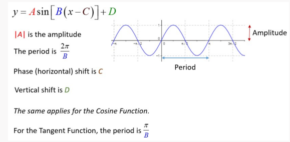
Area of a Sector Formula

$$A=\frac{1}{2}r^2\theta$$ for θ in ra

$$A=\frac{\theta}{360}\pi r^2$$ for θ in de

www.inchcalculator.com

Graphing Trigonometric Functions



Formulas

Distance Formula

$$d=\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$$

Midpoint Formula

$$\left(\frac{x_1+x_2}{2},\frac{y_1+y_2}{2}\right)$$

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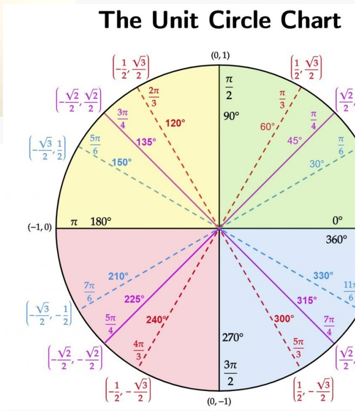

Rational Functions

Find an equation (in factored form) of a rational function, f, that satisfies the following conditions:

vertical asymptote: $x=4$
Need factor in the denominator $x-4=0$

x-intercept: $(-3,0)$ $x=-3$
Need factor in the numerator $x+3=0$

hole at $x=-1$ $x+1=0$
Need same factor in numerator and denominator

horizontal asymptote: $y=-\frac{2}{5}$
Need degree of numerator and denominator to be the same and ratio of leading coefficients $=-\frac{2}{5}$

$f(x)=\frac{-2(x+3)(x}{5(x-4)(x}$

Trig Signs