Pre Calc Cheat Sheet

by bendystraw via cheatography.com/38297/cs/11944/

Sequences

Arithmetic Sequence	An = A1 + D(n - 1)
Geometric Sequence	An = A1(r^{n-1})
Finite Sum	Sn = A1(1 - r^n) / 1 - r
Infinite Sum (|r| < 1)	A1 / 1 - r

Volumes

Sphere	V = (4/3)πr^2 A = 4πr^2
Cone	V = (1/3)πr^2h
Pyramid	V = (1/3)bh
Cylinder	πr^2h

Sin/Cos

Law of Cosines	c^2 = a^2+b^2-2ab(cos(C))
Arc Length	L = rθ
Double angle:	sin2x = 2cosxsinx cos2x = $\cos^2$x - $\sin^2$x cos2x = 2$\cos^2$x - 1 cos2x = 1 - 2$\sin^2$x tan2x = 2tanx / 1 - $\tan^2$x
Half angle:	sinx/2 = +/- sqrt((1 - cosx) / 2) cosx/2 = +/- sqrt((1 + cosx) / 2) tanx/2 = +/- sqrt((1 - cosx) / (1 + cosx)) tanx/2 = (1 - cosx) / sinx

Vertical line test

If a vertical line intersects a supposed function at two different points, it is not a function.

Probability

Combinations:	Order doesn't matter 8c5 = 8! / (8-5)!5!
Permutations:	Order matters 8p5 = 8! / 5!
Probability:	P(A and B) = P(A) * P(B) P(A or B) = P(A) + P(B) - P(A and B) If A and B are mutually exclusive: P(A or B) = P(A) + P(B)

Coordinates

Point-slope form	y - y1 = m(x - x1)
Vertex of parabola:	x = -b/2a

Parabola

Vertex	(h, k)
Focus	(h, k +/- p)
Directrix	y = k - p

Ellipse

Center	(h, k)
Vertices	(h, k +/- a)
Foci	(h, k +/- c)
Major Axis	2a
Minor Axis	2b

Hyperbola

Center	(h, k)
Vertices	(h, k +/- a)
Foci	(h, k +/- c)
Asymptotes	y = k +/- (a/b)(x-h)

Sin/Cos/Tangent equations

Asin(Bx+C)+D	A = Amplitude B = Period C = Phase shift D = Vertical shift
sin or cos(Bx)	Period = 2π/b
tan(Bx)	Period = π/b

Binomial Theorum

$$(a+b)^n = \sum_{k=0}^{n} \binom{n}{k} a^{n-k} b^k$$

More binomial theorum

$$\binom{n}{k} = \frac{n!}{k!(n-k)!}$$