Cheatography

Trigonometry Cheat Sheet

by johanna e. . (sapphicpenguin) via cheatography.com/68096/cs/17152/

Quadratic Equation

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Discriminant

$b^2-4ac > 0$	2 real roots
$b^2-4ac = 0$	1 repeated root
$b^2-4ac < 0$	2 imaginary roots

Supplementary & Complementary Angles

supplementary angles	add up to 180°
complementary angles	add up to 90°

Pythagorean Theorem

$a^2+b^2=c^2$

45-45-90 triangles

a=b

c=a√2 or b√2

c/√2=a or b

30-60-90 triangles

c=2b

a=b√3

when a triangle's 3 angles are 30°, 60°, and 90°
a = long leg
b = short leg
c = hypotenuse

Area of a triangle

AΔ = (1/2)bh

SOH-CAH-TOA

sine	opposite/hypotenuse
cosine	adjacent/hypotenuse
tangent	opposite/adjacent

csc, sec, cot - the opposite of SOH-CAH-TOA

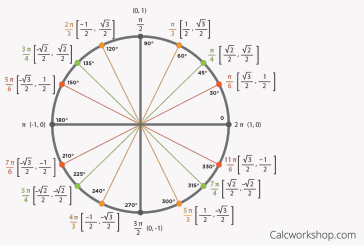
cosecant	hypotenuse/opposite
secant	hypotenuse/adjacent
cotangent	adjacent/opposite

Circle Measurements

Degrees & Radians

degrees to radians	θ·π/180
radians to degrees	θ·180/π

Unit Circle



Unit Circle values

sin	y
cos	x
tan	y/x
csc	1/y
sec	1/x
cot	x/y

for tan & cot, only use the tops of the fractions

Coterminal Angles

θ ± 360°	θ ± 2π

y = a (sin) b (x - c) + d

a	amplitude change
b	period change
c	horizontal change: + = left, - = right
d	vertical change: + = up, - + down
-sin(x)	reflection across x-axis
sin(-x)	reflection across y=axis

Amplitude & Period

amplitude	vertical
period	horizontal

both always positive
tan, cos, sec, cot: no amplitude

Inverses

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

csc(x) = 1/sin(x)

restricting range: usually I & IV
except in $\cos^{-1}$: I & II

Reciprocal Identities

sinθ = 1/cscθ	cscθ = 1/sinθ
cosθ = 1/secθ	secθ = 1/cosθ
tanθ = 1/cotθ	cotθ = 1/tanθ

Ratio Identities

tanθ = sinθ/cosθ	cotθ = cosθ/sinθ

Pythagorean Identities

$\sin^2\theta + \cos^2\theta = 1$

$\tan^2\theta + 1 = \sec^2\theta$

$1 + \cos^2\theta = \csc^2\theta$

Double-Angle Identities

sin2θ = 2sinθcosθ

tan2θ = 2tanθ / 1-tan²θ

cos2θ = cos²θ - sin²θ
cos2θ = 1 - 2sin²θ
cos2θ = 2cos²θ - 1

some more identities

sin(a+b) = sin(a)cos(b) + cos(a)sin(b)

sin(a-b) = sin(a)cos(b) - cos(a)sin(b)

cos(a+b) = cos(a)cos(b) - sin(a)sin(b)

cos(a-b) = cos(a)cos(b) + sin(a)sin(b)

tan(a+b) = tan(a)+tan(b) / 1-tan(a)tan(b)
tan(a-b) = tan(a)+tan(b) / 1+tan(a)tan(b)

area	πr^2
diameter	$2r$
circumference	$2\pi r$ OR πd
arc length	θr

r = radius
d = diameter
θ = angle

By **johanna e. .**
(sapphicpenguin)

cheatography.com/sapphicpenguin/
www.twitter.com/gay_librarian

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