Quadratic Expressions & Trigonometry Cheat Sheet

by NiffyYT via cheatography.com/188450/cs/39308/

Factorising using a common multiple

$5x^2+10x$	LCM is 5x
$= 5x(x+2)$	

Factorising & Expanding Two Squares

Rewrite as a difference of two squares	x^2-16
$= x^2-4^2$	$= (x+4)(x-4)$
Rewrite as a difference of two squares	
$16x^2-9y^2$	$= (4x)^2-(3y)^2$
$= (4x+3y)(4x-3y)$	
Difference of squares in the form $ab^2x^2-ac^2y^2$	
$18x^2y^4-98x2z2$	$= 2x2(9y^4-49z2)$
$= 2x^2[(3y^2)^2-(7z)^2]$	$= 2x^2(3y+7z)(3y-7z)$

Factorising Monic Trinomials

Factorise x^2+4x+3	Find factors of 3, summing to 4
1 & 3	$= (x+1)(x+3)$
Factorise $x^2-12x+32$	Find factors of 32, summing to -12
-4 & -8	$= (x-4)(x-8)$

Perfect Squares

Is $16x^2-8^2+1$ a perfect square?	a=4, b=1
-2x4x1=8	Yes, $(4x-1)^2$

Algebraic Fractions

5x+10/5	5(x+2/5
= (x+2)	
Factorise where possible	
$x^2-5x+6/x^2-7x+12$	$= (x-3)(x-2)/(x-3)(x-4)$
= (x-2)(x-4)	
Multiply & Dividing	$2x^2/x^2+x \div 4x^2/6x+6$
$= 2x^2/x(x+1) \div 4x^2/6(x+1)$	$= 2x^2/x(x+1)$ X $6(x+1)/4x^2$
=6/2x = 3/x	
Adding & Subtracting	
5/xy + 6/xy - m/xy	5+6-m/xy
= 11-m/xy	
b. when the denominators are different	1/x - 2/y
LCD = xy	1 X y/xy - 2 X x/xy
1/x - 2/y = y/xy - 2x/xy = y-2x/xy	

Trigonometry

$c^2 = a^2 + b^2$	SOH CAH TOA
DMS button on calculator	XX*XX'XX"
Find the missing side. x	
tan77* = x/5.9	x = 5.9tan77*
= 26	
b. x in denominator	
tan29*16'=23.1/x	x = 23.1/tan29*16'
= 41.22	
Find a missing angle	
use $\sin^{-1}$ $\tan^{-1}$ or $\cos^{-1}$ with existing sides	

Simultaneous Equations

Substitution Method	
y = 3x-7 (1)	2x-3y=12 (2)
Sub (1) into (2)	2x+3(3x+7) = 12
2x+9x-21=12	11x = 33
x = 3	
Elimination Method	
3x-2y =14 (1)	
5x+2y = 18 (2)	+

8x = 32	x = 4
sub into (2)	
20+2y=18	2y = -2
-20 both sides	y = -1

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