



BHASVIC

MaTHS

C3

C3 June/July

Maths Survival Kit

Name.....

Plan for June/July lessons

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June 15th	Algebraic Fractions Algebraic Division	3 4	
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C3 : Algebraic Fractions

- Be able to add, subtract, multiply and divide simple algebraic fractions
- Have practiced factorising and 'cancelling'
- Recognise the difference of squares
- Be able to use adding, subtracting, multiplying and dividing simple algebraic fractions to solve algebraic equations



Simplify $\frac{2}{y^2-x^2} + \frac{3}{y-x}$

C3 Algebraic Division

Be able to use algebraic division to find quotients and remainders



Express $\frac{4x^3 - 5x^2 + 3x - 14}{x^2 + 2x + 1}$ in mixed number format

C3: Reciprocal Trig Functions

- Know the definitions of $\sec x$, $\operatorname{cosec} x$ and $\cot x$ in terms of $\cos x$, $\sin x$ and $\tan x$
- Be able to sketch the graphs of $\sec x$, $\operatorname{cosec} x$ and $\cot x$ without using a calculator
- Be able find values of $\sec x$, $\operatorname{cosec} x$ and $\cot x$ for real x over a given interval.
- Understand that $\sec x = \frac{1}{\cos x}$ not $\frac{1}{\cos}(x)$ and that the latter makes no sense
- Use reciprocal trig functions to solve equations and prove identities

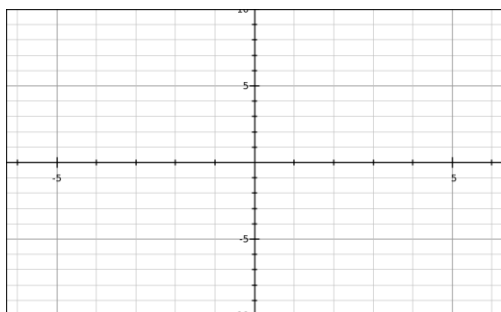


Complete this table:

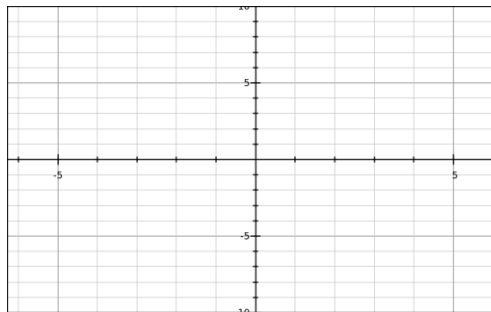
$\frac{1}{\sin \theta}$		
$\frac{1}{\cos \theta}$		
$\frac{1}{\tan \theta}$		

Sketch the graphs shown

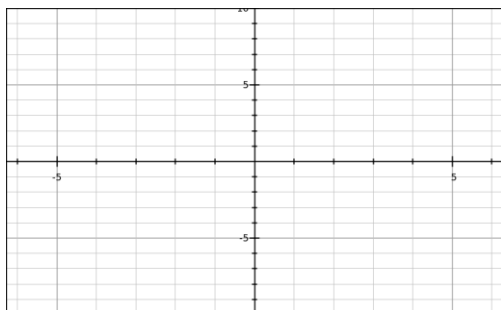
$$y = \sec x$$



$$y = \operatorname{cosec} x$$



$$y = \cot x$$



Please turn to the next page for Algebraic Proof

Prove that $\cos\theta + \sin\theta\tan\theta \equiv \sec\theta$

C3 Pythagorean Identities

- Know all three Pythagorean trig identities
- Understand the proofs of all three Pythagorean identities
- Have experience of using the Pythagorean identities to prove identities and solve equations



Complete this table

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

Prove that $\operatorname{cosec}^4 \theta - \cot^4 \theta \equiv \frac{1 + \cos^2 \theta}{1 - \cos^2 \theta}$

C3 Chain Rule

Be able to use the chain rule to differentiate compositions of polynomials, and trig functions



Differentiate $(5x^3 - 2x)^6$

C3: The Product Rule

- Know the product rule
- Be able to use the product rule to differentiate products of polynomials, $\sin x$ and $\cos x$



Differentiate $x^4(2x^2 + 3x)^5$

C3 The Quotient Rule

- Know the quotient rule
- Be able to use the quotient rule to differentiate products of polynomials and trig functions



What is the formula for the quotient rule?

Differentiate $\frac{(x^2+5)^3}{4x}$

C3: Differentiating trig functions

- Know the derivatives of all six trig functions
- Be able to use the derivatives of trig functions to integrate
- Understand why x must be measured in radians when differentiating or integrating trig functions of x



Complete this table

y	$\frac{dy}{dx}$
$\sin x$	
$\cos x$	
$\tan x$	
$\sec x$	
$\operatorname{cosec} x$	
$\cot x$	

When differentiating, you should measure angles using

C3: Trig consolidation



Solve the equation $4 \operatorname{cosec}^2 \theta - 9 = \cot \theta$

C3: The Compound Angle Formulae

- Know all three compound angle formulae
- Be able to prove the expansion of $\tan(A \pm B)$ using the expansions of $\sin(A \pm B)$, $\cos(A \pm B)$
- Have experience of using the compound angle formulae to prove identities and solve equations
- Feel confident using the compound angle formulae to solve equations



Complete this table

$\sin(A \pm B) =$	
$\cos(A \pm B) =$	
$\tan(A \pm B) =$	

C3: The Double Angle Formulae

- Know the double angle formulae
- Be able to prove the double angle formulae using the compound angle formulae and the half angle formulae using the formulae for $\cos 2x$
- Have experience of using the double angle formulae to prove identities and solve equations



Complete this table

$\sin 2A$	
$\cos 2A$	
$\cos 2A$	
$\cos 2A$	
$\tan 2A$	

C3: Factor formulae

The factor formulae



Complete this table

$\sin P + \sin Q$	
$\sin P - \sin Q$	
$\cos P + \cos Q$	
$\cos P - \cos Q$	