

Oceania

MathsJam Jam

Songbook

2022

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For Cosine, Tan and Sine

Lyrics by Alison Kiddle 2018

To the tune of Auld Lang Syne

Should SOHCAHTOA be forgot
When trig is brought to mind?
The unit circle is your friend
For cosine, tan and sine.

*For cosine, tan and sine, my dear,
For cosine, tan and sine,
The unit circle helps you out
With cosine, tan and sine.*

And surely x gives you the cos
And y gives you the sine,
The tangent is the gradient
Of th'hypotenuse incline.

*For cosine, tan and sine, my dear,
For cosine, tan and sine,
The unit circle helps you out
With cosine, tan and sine.*

And there's a hand my trusty friend
To work out the length of lines
In each right-angled triangle
With cosine, tan and sine.

*For cosine, tan and sine, my dear,
For cosine, tan and sine,
The unit circle helps you out
With cosine, tan and sine.*

What shall we do with the function, Taylor?

Lyrics by Martin Harris 2018

To the tune of The Drunken Sailor

What shall we do with the function, Taylor?

What shall we do with the function, Taylor?

What shall we do with the function, Taylor?

Early in the MathsJam

Refrain:

Maintain derivatives

Maintain derivatives

Maintain derivatives

Early in the MathsJam

Sum for n from zero to infinity

Sum for n from zero to infinity

Sum for n from zero to infinity

Early in the MathsJam

Refrain

Differentiate to the n th degree

Differentiate to the n th degree

Differentiate to the n th degree

Early in the MathsJam

Refrain

Multiply by $(x - a)$ to the n

Multiply by $(x - a)$ to the n

Multiply by $(x - a)$ to the n

Early in the MathsJam

Refrain

Finally divide by n -factorial

Finally divide by n -factorial

Finally divide by n -factorial

Early in the MathsJam

Refrain

Millennium Prize Song

Lyrics by Derek Couzens 2017

*To the tune of **Where have all the flowers gone?***

What line are the zeros on?
Of the Zeta Function
What line are the zeros on?
This no one knows
What line are the zeros on?
Riemann predicted every one.
When will we ever learn? When will we ever learn?

Is $P = NP$ wrong?
This is quite a tricky one
Is $P = NP$ wrong?
This no one knows
Is $P = NP$ wrong?
Solve this for a million
And maybe a Nobel gong ... maybe a Nobel gong.

How does all the fluid flow?
Smooth or Turbulent there it goes
How does all the fluid flow?
This no one knows
Solve the equations of Navier-Stokes
And publish it to all math folks
It'll earn you lots of dough. It'll earn you lots of dough.

Now we come to Poincaré.
For this we can shout Hooray
Now we come to Poincaré
Now this we know
Now we come to Poincaré
Perlmann put this one away
But he didn't want the prize. He didn't take the prize.

Three more problems we'll forget
From the famed Millennium septet
This ballad is too short to tell
And they don't scan too well
But if you want each one to know
Ask Ross and he will show
It all in 5 minutes or less ... in 5 minutes or less

Sin on Cos Can Turn into Tan

Lyrics by Colin Beveridge 2016

To the tune of Santa Claus is Coming to Town

You'd better swot up, it's hard to get by
Unless you know the graphs from 0 to 2π ,
Sin on cos can turn into tan.

You're squaring sin x, squaring the cos,
You're going to get one whatever x was,
Sin on cos can turn into tan.

You even know the hard ones,
you barely have to check
You know that $1 + \tan^2 x$
becomes the square of sec!

You've drawn it all out, it's easy to see,
Cos pi by six is half of root 3
Sin on cos can turn into tan.

You've picked up all the formulas,
you've read them through and through
The area of a sector
is $r^2 \theta$ over two

You used to hate radians, now it's your strength
Since you learned that $r \theta$ gives the arc-length
Sin on cos can turn into tan.

Your teacher's in a Santa hat,
you swear that you don't know her
Because there's really no excuse
for ho-ho-hoh-cah-toa.

You'd better swot up, it's hard to get by
Unless you know the graphs from 0 to 2π ,
Sin on cos can turn into tan.
Sin on cos can turn into tan.

I Fill in my Census

Lyrics by Rata Ingram 2021
To the tune of Annie's Song

I fill in my census
by ticking checkboxes,
by writing in numbers
in the space on the form.
Once every five years
StatsNZ comes knocking.
We fill in our census
to learn about us

Come statisticians,
let me give my life to you.
Let me give you my data,
my birthday, my name,
my workplace, my dwelling
my fam'ly and income,
let every household
come tell you again.

Let us count every person.
Our population
is growing again!

I fill in my census
by clicking the options
and typing my answers
on a digital form.
Ev'ry demographic
that makes up New Zealand
fills out the census:
our national survey.

Show your working out

Lyrics by Jillene Bailey 2022

To the tune of To make you feel my love

When report cards and grades appear
I know that bad results will hold no fears
Because my words were ringing in your ears
To show your working out

Write the formula to communicate
Then substitute the values that you allocate
Use order of operations as you calculate
You're showing working out

The answer follows at the very end
You know that I would never steer you wrong
And don't forget the units there, my learned friend
Communication matters, hence this song

I know your calculator is a handy tool
But over-reliance on it makes a man a fool
Please follow the instructions that you learned in school
To show your working out

Instrumental

I know you haven't graduated yet
But I would never steer you wrong
I've prattled on about this since the day we met
And now I've gone and written you this song!

You know that I only want the best for you, so I'll
Say this over and over till my face is blue
This year my fervent hope and prayer is that you
Will show your working out

Please show your working out

I Will Derive!

Lyrics by MindOfMatthew 2008

To the tune of I Will Survive

YouTube Link: <https://www.youtube.com/watch?v=P9dpTTpjymE>

At first I was afraid, what could the answer be?
It said given this position find velocity.
So I tried to work it out, but I knew that I was wrong.
I struggled; I cried, "A problem shouldn't take this long!"
I tried to think, control my nerve.
It's evident that speed's tangential to that time-position curve.
This problem would be mine if I just knew that tangent line.
But what to do? Show me a sign!

So I thought back to Calculus.
Way back to Newton and to Leibniz,
And to problems just like this.
And just like that when I had given up all hope,
I said nope, there's just one way to find that slope.
And so now I, I will derive.
Find the derivative of x position with respect to time.
It's as easy as can be, just have to take dx/dt .
I will derive, I will derive. Hey, hey!

And then I went ahead to the second part.
But as I looked at it I wasn't sure quite how to start.
It was asking for the time at which velocity
Was at a maximum, and I was thinking "Woe is me."
But then I thought, this much I know.
I've gotta find acceleration, set it equal to zero.
Now if I only knew what the function was for a.
I guess I'm gonna have to solve for it someway.

So I thought back to Calculus.
Way back to Newton and to Leibniz,
And to problems just like this.
And just like that when I had given up all hope,
I said nope, there's just one way to find that slope.
And so now I, I will derive.
Find the derivative of velocity with respect to time.
It's as easy as can be, just have to take dv/dt .
I will derive, I will derive.

So I thought back to Calculus.
Way back to Newton and to Leibniz,
And to problems just like this.
And just like that when I had given up all hope,
I said nope, there's just one way to find that slope.
And so now I, I will derive.
Find the derivative of x position with respect to time.
It's as easy as can be, just have to take dx/dt .
I will derive, I will derive, I will derive!

Four Colour Theorem

Lyrics by Rata Ingram 2022
To the tune of Frère Jacques

Four colours
Four colours

Shade a map
Shade a map

None the same need share an edge
None the same need share an edge

Just prove that!
Just prove that!

HAVE I PROVED YA
Lyrics by Todd Rangiwhetu
To the tune of Hallelujah (Cohen)

I heard there was a secret chord
That David drew and it pleased the lord
But you don't really care for proofs now do ya?
Scribe an arc on the left and right
Scribe anew with all your might
Draw perpendicular but really have I proved ya?

Have I proved ya (x m)

If you raise a b c to power n

Except for 2 they don't meet again
At least for all the triples been checked so far
I wrote a proof in the margin once
The rest is easy don't be a dunce
It's obvious but really have I proved ya?

Have I proved ya (x n)