MATH SONG

SING-A-LONG

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TAKE THE LIMIT

WORDS BY: JOHN A. *CARTER*
TUNE: *"THE* RUBBER TREE PLANT"

Say you really wanted to know,
Where all of the y-values go,
As you approach a value - a finite value of c.
Then take the limit,
Take the limit,
And you will find out where all of those y-values go.
So come on in from the left and
Come in from the right
And together you'll find
What's the limit as x approaches,
What's the limit as x approaches,
What's the limit as x approaches c?

Say you really wanted to know
Where the slope of the secants will go,
As you approach a fixed point on the graph of f.
Then take the limit,
Take the limit,
And you will find out where the slope of the secants will go.
So come on in from the left and
Come in from the right
And together you'll find
What's the slope of the tangent at,
What's the slope of the tangent at,
What's the slope of the tangent at x?

Say you really wanted to know,
Where the graph off will go,
As x increases without bound - toward infinity.
Then take the limit,
Take the limit,
And you will find out where the graph of the function will go,
So go on out to the left or
Go out to the right
And with either you'll find
What's the horizontal asymptote,
What's the horizontal asymptote,
What's the horizontal asymptote of f?

DON'T THINK TWICE
WORDS BY ALF ESTBERG AND DANE R. CAMP
TUNE: "DON'T THINK TWICE, IT'S ALRIGHT"

It ain't no use to sit around and cry, guy
You just didn't do your best,
And any fool can tell you 'xactly why - - (sigh)
You shoulda studied for the test!
Now you wish there was something you could do or say
To change that grade but there's just one way.
You'll just have to do your homework everyday!
Don't think twice, it's alright.

Now I think it's time you turned on your light - - bright!
Cuz the light will help you know
What you've done wrong and how to get it right - - (right!)
For your grade is way too low.
So open your mind and go do the work,
For the more that you do, the less you'll shirk,
And no one cares that your teacher's a jerk.
Don't think twice, it's alright.

Now you're walking down the road to success.
The future's in your hands
For you've erased the memory of that mess - - (yes!)
And you're squarely in command.
So spread the word from here to Timbuktu,
There ain't nothing anyone can do for you,
That you can't do yourself....you know it's true.
Don't think twice, it's alright.

BASIC GRAPHS
WORDS BY: JOHN A. CARTER
TUNE: "CAISSONS GO ROLLING ALONG"

Come join us as we graph.
Use your arms and maybe laugh
As we review the twelve curves you know.

Quadratics, and the line,
Y's a constant, and the sine,
Y is e to the x - watch it grow,

Here's the cube and the tangent too.
Let's not forget all of the roots - square and cube and so on.
Natural log and one over x,
One on x squared is important too.

THE QUADRATIC FORMULA
WORDS BY: JOHN A. CARTER
TUNE: "AMAZING GRACE"

If you need to solve a quadratic
Equation in any form,
Set it equal to zero,
And use this formula.
You'll have the zeroes before you know.

x equals the opposite of *b*
Plus or minus the square root
Of *b* squared minus 4*a* times *c*
All over two times *a*.

ALTERNATE TUNE: "NOTRE DAME FIGHT SONG" (FROM NCTM ANNUAL 1988)

x equals opposite *b*
Plus or minus the square root of
b squared minus 4*ac*
All over two times *a.*

GRAPH THAT POLYNOMIAL
WORDS BY: JOHN A. CARTER
TUNE: "SWING LOW SWEET CHARIOT"

Refrain: Graph that polynomial.
Graph it right here and now.
Just sketch that ole polynomial,
Hope you don't forget just how.

The first thing you ask yourself,
"is it even or odd degree?"
In other words, do its ends do this
or do they do one of these?
(Hold arms up then down for even, alternate for odd.)
(Refrain)

The next thing you have to locate
is the y-intercept.
This ole point's not too hard to find,
just sub zero in x.
(Refrain)

The next thing you have to find
are the x-intercepts.
Set each factor equal to zero,
then solve each for x.
(Refrain)

The next thing you ask yourself,
"Are these roots evens or odds?"
Does it pass on through or 'sit bounce back from
those x-intercept dots?
(Refrain)

The last thing you have to find
where's the max/min in here?
To answer this, you will need the Calculus.
You'll learn this next year!

UNIT CIRCLE
WORDS BY: J014N A. CARTER
TUNE: "ON TOP OF OLD SMOKEY"

When you wrap a-round the unit circle,
Given an arc's length find (cosine, sine) you will.

When you wrap a zero, that's nothing I'll show,
You're right where you start at one comma zero.

When you wrap to one pi, you're half-way around.
Negative one comma zero's the point where you're found.

When you wrap a two pi, that's easy. Here's why:
You're back where you started one, zero surprise.

When you wrap to straight up, that's pi over two.
One is your y here. Zero's your x-value.

When you wrap on down to three pi over two,
Negative one's now your y here and zero's x down here too.

When you wrap on up to a pi over six,
Root three over two's x and y is three-sixths.

When you continue to pi over four,
Root two over two's both x and y that's for sure.

When you go on up to a pi over three,
One-half is your x and y's one-half root three.

When we go further to quadrants two, three
And four all we need is to use symmetry.

SIERPINSKI'S GASKET

WORDS BY: DANE R. CAMP
TUNE: "MEIN HUT DER HAT DREI ECKEN" OR
"MY HAT IT HAS THREE CORNERS"

My fractal has but three comers,
Just count them: 1, 2, 3.
And if you look at each comer,
You cannot help but see,
A fractal that has three comers...
(Continue from line two.)

MORE MATH FOR ME!

WORDS *BY:* DANE R. CAMP
TUNE: "KING OF THE ROAD"

TI, you're heaven sent
Straight from Texas Instruments.
New cord and batteries,
You make math class such a breeze.
Two hours of plotting dots
Gone with just one zoom-in box.
Lose those anxieties!
Get one of these.

I know every button and every menu
All of the functions and programming too!
Every trick for getting around,
And if you don't drop it, it won't make a sound.

TI, now I know for sure,
You're a primo calculator.
You do the moron work so I have
More math for me ...
More math for me ...
More math for me.

THE FINISHED PROOF
WORDS BY: ALF ESTBERG'S GEOMETRY CLASS
TUNE: "THE BRADY BUNCH THEME"

Here's the story of a lonely statement
Who was proving congruent triangles on his own.
All of them had angles and sides from the givens
But they weren't done with the proof.

Here's the story of a lovely reason
Who knew SAS, ASA, and HL
But was nothing without a statement
And was in living hell.

But 'til the one day when the statement met this reason
And they knew they could live under the same roof'.
That this problem would finally be complete
And that's the way they became the finished proof.

The finished proof,
The finished proof,
And that's the way they became the finished proof.

I LOVE TO LEARN MATHEMATICS
WORDS BY: DANE R. CAMP
TUNE: "TAKE ME OUT TO THE BALLGAME"

I love to learn math-e-ma-tics
Like sol-ving e-qua-tions with x
And all of the shapes in ge-o-me-try
Or graph-ing a func-tion with tech-no-lo-gy
For it's roots and pow-ers I live for
Or a log-rithm now and then
And with sine, co-sine and the tan-gent
I'm in math Hea-ven!

SOHCAHTOA!

WORDS BY: KATHY ANDERSON
TUNE: "OKLAHOMA!"

SOHCAHTOA where we de-fine sine, cosine, and tan.
And the ratios of each of those follow letters S, C, and T.
SOHCAHTOA - opposite on hypotenuse is sine,
And for cosine oh, it's the ratio,
Of ad-ja-cent on hypotenuse.
We know we can't forget tan, it's the opposite on a-jay-cent.

And when we say LABEL YOUR SIDES, a trig-o-nom-e-try,
CHOOSE YOUR FUNCTION.
We're only saying thanks for your help SOHCAHTOA.

SOHCAHTOA. SOHCAHTOA,
SOHCAHTOA, okay!

CHEERS TO INTEGRATION

WORDS BY: STUDENTS IN J. CARTER'S CALCULUS AB CLASS
TUNE: "THE CHEERS THEME"

Integrating with trig identities takes everything you've got.
Antidifferentiating sure can take a lot.
Wouldn't you like to learn a way... ?

Sometimes you want to know:
Just how does one integrate?
Wouldn't that be super great?
You want to know how you can show
You're better that any average Joe
You want to know how you can integrate.

THE TWELVE DAYS OF ALGEBRA
WORDS BY: JOHN A. CARTER
TUNE: "THE TWELVE DAYS OF CHRISTMAS"

On the first day of algebra my teacher taught to me that math
class can be fun.
On the second day of algebra my teacher taught to me:
variables and that math class can be fun.
On the third day of algebra my teacher taught to me:
combining like terms...
On the fourth day of algebra my teacher taught to me:
distributing...
On the fifth day of algebra my teacher taught to me:
solving equations...
On the sixth day of algebra my teacher taught to me:
how to find slope...
On the seventh day of algebra my teacher taught to me:
graphing of lines...
On the eighth day of algebra my teacher taught to me:
fitting lines to data...
On the ninth day of algebra my teacher taught to me:
probability...
On the tenth day of algebra my teacher taught to me:
exponential curves...
On the eleventh day of algebra my teacher taught to me:
quadratic functions...
On the twelfth day of algebra my teacher taught to me:
systems of equations...

WE WILL GRAPH YOU!
WORDS BY: JOHN A. CARTER
TUNE: "WE WILL ROCK YOU!"

Buddy, you're a man with a hard time graphing.
All you need to do is find the m and the *b.*
It's not too hard you see,
You put your pencil on the *b.*
Graphing's not as hard as you thought it might be, singing

Chorus: We will, we will graph you!
We will, we will graph you!

Now you've got a point on the y-intercept.
All you need to do is find the rest of it.
You need the slope to go on,
That's rise over run.
Delta y in delta x, boy it's fun, singing...

(Chorus)

Next, take the coefficient of the x baby.
Find two more points and another one maybe.
Go up or down first,
Then go across.
I dig graphing lines, I think it's boss, singing...

(Chorus)

THE PROPERTY SONG

WORDS BY: JOHN A. CARTER
TUNE: "THIS OLD MAN"

This property, the Commutative Property,
Tells us that we are free
To change the order of a sum,
Also in a multiplication.

This property, the Associative Property,
Tells us that you and me
Can change the grouping when we multiply,
Do it when you add, it'll make you look sly,

This property, the Identity,
Tells us that so obviously
Anything times one will not change,
Anything add zero will still remain.

This property, the Inverse Property,
Tells us that which we can see
Multiply by the reciprocal to always obtain one,
Add the opposite to anything to always leave none.

This property, the Distributive Property,
Talks to us about a quantity
Which contains a sum and is being multiplied.
Take the product with each term inside.

HOMEWORK CONNECTION

WORDS BY: DANE R. CAMP
TUNE: "RAINBOW CONNECTION"

How come there aren't any songs about homework
And problems we tackle with pride?
Homework completion can improve precision,
'Cause you must always show what you tried...

Homework's important some may not believe it.
I know they're wrong, wait and see.
Someday they'll find it - the homework connection,
The students, the teachers, and me.

Who said to show your work
Not just the answers
On every assignment that's due?
Somebody long ago
Thought it'd be helpful
And deep down you know that it's true!

If math is frustrating
Stop procrastinating
And then in your heart you will see.
Soon you will I] find it -the homework connection,
The students, the teachers, and me.

All of us want to do well
And we know that it takes More than magic!

Have you been half-asleep?
And have you heard voices?
The teacher is calling your name.
The blank test you hand in
Looks just like the homework
The questions are one and the same.
You've done this too many times to pretend that
The secret is not plain to see.

Now you have found it - the homework connection,
The students, the teachers, and me.

COMPLEX NUMBERS
WORDS BY: DANE R. CAMP
TUNE: "OLD MACDONALD"

Complex numbers are lotsa fun. *i-i-i-i-i*
'Cause i's the square toot of negative 1. *i-i-i-i-i*
With an (*a + bi)* here and an (*a + bi)* there.

Here an (*a + bi) ,* there an (*a + bi)*

Everywhere an (*a+ bi).*

Complex numbers are lotsa fun. *i-i-i-i-i*

i squared is just negative one*, i-i-i-i-i*
So powers of *i* are easily done. *i-i-i-i-i*
With an *i* squared here and an *i* squared there.
Here an *i* squared, there an *i* squared,
Everywhere an *i* squared.
i squared is just negative one. *i-i-i-i-i*

Adding is just like a game. *i-i-i-i-i*
Just com-bine terms that are the same. *i-i-i-i-i*
With a like term here and a like term there.
Here a like term, there a like term,
Everywhere a like term.
Adding is just like a game. *i-i-i-i-i*

Mul-ti-pli-ca-tion is not toil. *i-i-i-i-i*
Just ex-pand it by using FOIL. *i-i-i-i-i*
With a product here and a product there.
Here a product, there a product,
Everywhere a product, product.
Mul-ti-pli-ca-tion is not toil. *i-i-i-i-i*

Di-vi-sion is really great. *i-i-i-i-i*
Multiply both by the con-ju-gate. *i-i-i-i-i*
With a conjugate here and a conjugate there,
Here a conjugate, there a conjugate,
everywhere a con-ju-gate.
Di-vi-sion is really great. *i-i-i-i-i*

THE POLYNOMIAL DANCE
WORDS BY: DANE R. CAMP
TUNE: "HOKEY POKEY"

You put your right hand out,
You put your left hand out,
You can even flip direction
Or jump straight up and down.
Now that's a constant function
And it makes you want to shout,
"Polynomials can dance about!"

You put your right hand up,
You put your left hand down,
You can alternate direction
Or jump straight up and down.
Now that's a linear function
And it makes you want to shout,
"Polynomials can dance about!"

You put your right hand up,
You put your left hand up,
You can even flip direction
Or jump straight up and down.
Now that's a quadratic function
And it makes you want to shout,
"Polynomials can dance about!"

You put your right hand up,
You put your left hand down,
You can alternate direction
Or jump straight up and down.
Now that's a cubic function
And it makes you want to shout,
"Polynomials can dance about!"

FRACTAL GEOMETRY

WORDS BY: DANE R. CAMP
TUNE: "YELLOW SUBMARINE"

Chorus: We love to do fractal geometry,
Fractal Geometry, fractal Geometry,
We love to do fractal geometry,
Fractal geometry, fractal geometry,
In the world that we all live,
There's so much that we don't understand,
But there's a tool that we now have,
That will certainly lend us a hand.

(Chorus)

Technology helps us to find
Lots of connections that were missed before.
A country's coast and von Koch curve
Can be shown to have the same structure.

(Chorus)

All the trees out in the woods
Aren't Euclidean that's plain to see
And the fungus on your feet,
Have self-similar geometry.

(Chorus)

THE CHAIN RULE
WORDS BY: JOHN A. CARTER
TUNE: "CLEMENTINE"

Here's a function in a function
And your job here is to find
The derivative of the whole thing
With respect to *x* inside.

Call the outside *f* of *u*
And the inside *u* of *x*.
Differentiate to find *df/du*
And multiply by *du/dx*.

Use the chain rule.
Use the chain rule.
Use the chain rule whene'er you find
The derivative of a function compositionally defined.

THE BINOMIAL SQUARE THEOREM
WORDS BY: DANE R. CAMP
TUNE: "YANKEE DOODLE DANDY"

$$(x + y)^2 \neq x^2 + Y^2$$

x + y quan-ti-ty squared
Is NOT x squared plus y squared
'Cause if you try to FOIL it out
A middle term has ap-peared.

$$(x + y)^2 = x^2 + 2xy + Y^2$$

You can use this form-u-la
to square an-y bi-no-mial,
just sub-sti-tute for x and y,
then simplify the tri-no-mial!

THE NUMBER WE CALL *e*
WORDS BY. DANE R. CAMP
TUNE: "THE LION SLEEPS TONIGHT"

Chorus: *e-e-e-e e-e-e-e-e* 2 point 7-1-8

2-7-1-8 (10 times)

There's a number
A special number
We use it constant-leeee (2 times)

(Chorus)

For log-a-rithms
Yes log-a-rithms
The base is naturally-eeee (2 times)

(Chorus)

To com-pound int'rest
Contin-u-ous int'rest
It's Pert shampoo for meeeeeee (2 times)

(Chorus)

(Two parts: ad nauseam)

Part 1: *e-e-e-e e-e-e-e-e,* 2 point 7- 1 -8
Part 2: 2-7-1-8,...2-7-1-8, ...2-7-1-8