NUMBRIX

A NEW MATH PUZZLE BY MARILYN vos SAVANT

From: http://www.parade.com/askmarilyn/numbrix/071308

Directions:
Starting anywhere, fill in the blank squares with the missing numbers so they make a path in numerical order, 1 through 49. You can work horizontally or vertically in any direction. Diagonal paths are not allowed.

SAMPLE PUZZLE from Ask Marilyn [14 July 2008]

3	2	47	48	49	40	39
4						38
5						37
20						34
21						33
22						32
23	24	27	28	29	30	31

Solution:

3	2	47	48	49	40	39
4	1	46	45	42	41	38
5	6	7	44	43	36	37
20	19	8	9	10	35	34
21	18	17	16	11	12	33
22	25	26	15	14	13	32
23	24	27	28	29	30	31

Try this one on your own!

Numbrix-7 (From July 13 Issue of PARADE - view the solution)

1	2	3	4	7	8	9
28						10
29						13
32						14
33						15
46						16
47	48	49	42	41	18	17

Now the numbers needed are 1 through 64

Numbrix-8

62	63	64	1	2	7	8	9
61							10
48							13
47							14
44							15
43							16
40							17
39	38	37	32	31	30	19	18

Limit and Derivative Numbrix

Solve the clues which will give you a number from 1 to 49 and place your solution in the appropriate box. Then solve the Numbrix puzzle.

Remember: Complete 1-49 so the numbers follow a horizontal or vertical path. [No diagonal.]

Clue A	Clue B	Clue C	Clue D	Clue E	Clue F	Clue G
Clue X						Clue H
Clue W						Clue I
Clue V						Clue J
Clue U						Clue K
Clue T						Clue L
Clue S	Clue R	Clue Q	Clue P	Clue O	Clue N	Clue M

Letter	Clue	Letter	Clue
A	$\lim_{x\to\frac{\pi}{4}} \tan x$	T	$f'(3)$ if $f(x)=2x^3-8x$
B	$f'(1)$ if $f(x)=x^2$	U	$f'(2)$ if $f(x)=x^3+4x^2+5x$
C	$\lim_{x\to 0} 3\cos x$	V	$\lim_{x\to 32} e^{\ln x}$
D	$f'(1)$ if $f(x)=x^2+2x$	W	$f'(1)$ if $f(x)=17x^2-5x$
E	$\lim_{x\to\frac{\pi}{2}} 7\sin x$	X	$\lim_{x\to 14} \frac{x^2-196}{x-14}$
F	$\lim_{x\to 3} \frac{x^2+2x-15}{x-3}$		
G	$f'(\sqrt{3})$ if $f(x)=x^3$		
H	Vertical asymptote of $y=\frac{x+10}{x^2-100}$		
I	$\lim_{x\to 13} \ln e^x$		
J	$\lim_{x\to 5} \frac{x^2+4x-45}{x-5}$		
K	$f'(1)$ if $f(x)=5x^3$		
L	$\lim_{x\to 16} e^{\ln x}$		
M	$\lim_{x\to 2\pi} 17\sec x$		
N	$f'(2)$ if $f(x)=x^3+x^2+2x$		
O	$f'(2)$ if $f(x)=x^4+2x^2+x$		
P	$f'(0.5)$ if $f(x)=33x^2+9x$		
Q	$f'(3)$ if $f(x)=x^3+4x^2-2x$		
R	$f'(0.5)$ if $f(x)=\frac{-3}{x^2}$		
S	$f'(20)$ if $f(x)=x^2+7x$		

SOLUTIONS

Numbrix-8

62	63	64	1	2	7	8	9
61	60	59	58	3	6	11	10
48	49	50	57	4	5	12	13
47	46	51	56	55	24	23	14
44	45	52	53	54	25	22	15
43	42	35	34	27	26	21	16
40	41	36	33	28	29	20	17
39	38	37	32	31	30	19	18

Limit and Derivative Numbrix Solution

1	2	3	4	7	8	9
28	27	26	5	6	11	10
29	30	25	24	23	12	13
32	31	36	37	22	21	14
33	34	35	38	39	20	15
46	45	44	43	40	19	16
47	48	49	42	41	18	17

Clue A	Clue B					Clue C	Clue D	
Clue V				Clue W	9		Clue H	Clue I
			5			4		
	Clue E	Clue F		Clue G	5		2	
Clue J	Clue K		2		Clue L		Clue M	Clue N
	Clue O		9	7		Clue U	Clue S	
		Clue T			Clue P			
Clue Y	Clue R		6	8				Clue Z
	Clue Q	Clue X					4	6

Directions:
Solve the following list of clues [A through Z]. Place the numerical values of your answers in the block which corresponds to the clue. Then have fun solving the Sudoku.

This Sudoku is based on the May 18th Sudoku from The Daily Sudoku.

Letter	Clue	Letter	Clue
A	$\lim_{x\to 0} 5\cos x$	N	$\lim_{x\to 16} \frac{(x-16)\left(\sqrt{x}+4\right)}{x-16}$
B	$\lim_{x\to 9} \ln e^{x}$	O	$\lim_{x\to 2} \frac{x^2+x-6}{x-2}$
C	$\lim_{x\to 12} \lvert 4-x \rvert$	P	$\lim_{x\to 1} \frac{x^2-1}{x^3-x^2}$
D	$\lim_{x\to \frac{\pi}{4}} \tan x$	Q	$\lim_{x\to 16} \frac{x-16}{\sqrt{x}-4}$
E	$\lim_{x\to \frac{\pi}{2}} 3\sin x$	R	$\lim_{x\to e} \ln x$
F	$\lim_{x\to 1} \frac{8x}{2x-1}$	S	$\lim_{x\to \frac{\pi}{6}} 12\sin x$
G	$\lim_{x\to 6} e^{\ln x}$	T	$\lim_{x\to 6} \frac{x^2-8x+12}{x-6}$
H	$\lim_{x\to 2} \frac{5x-10}{x-2}$	U	$\lim_{x\to 1} \frac{x^3-1}{x-1}$
I	$\lim_{x\to 1} \frac{x^2-1}{x-1}$	V	$\lim_{x\to 1} \frac{3x^2-4x+1}{x^2-1}$
J	$\lim_{x\to \pi} \left(9\sin^2 x+9\cos^2 x\right)$	W	$\lim_{x\to 0} \frac{x-6}{x^2-2}$
K	$\lim_{x\to 3} \frac{x^2-9}{x-3}$	X	$\lim_{x\to 11} \frac{x^2-13x+22}{x-11}$
L	$\lim_{x\to 2\pi} 3\cos x$	Y	$\lim_{x\to \frac{\pi}{6}} \csc x$
M	$\lim_{x\to 0^+} \frac{\lvert 7x \rvert}{x}$	Z	$\lim_{x\to \frac{\pi}{3}} \tan^2 x$

The Daily SuDoku: Sun 18-May-2008

5	9					8	1	
1				3	9		5	2
			5			4		
	3	8		6	5		2	
9	6		2		3		7	8
	5		9	7		3	6	
		4			2			
2	1		6	8				3
	8	9					4	6

Daily SuDoku: Sun 18-May-2008 easy

The Daily SuDoku: Sun 18-May-2008

5	9	3	4	2	6	8	1	7
1	4	7	8	3	9	6	5	2
8	2	6	5	1	7	4	3	9
7	3	8	1	6	5	9	2	4
9	6	1	2	4	3	5	7	8
4	5	2	9	7	8	3	6	1
6	7	4	3	9	2	1	8	5
2	1	5	6	8	4	7	9	3
3	8	9	7	5	1	2	4	6

Daily SuDoku: Sun 18-May-2008 easy

Yet Another Calculus Sudoku **lastsudoku.doc**

Directions:
Solve the following list of clues. Place the numerical values of your answers in the block which corresponds to the clue. Then have fun solving the Sudoku.

Clue A		Clue B	Clue C					
Clue D					Clue E	Clue F		
	Clue G				Clue H		Clue I	
	Clue J	Clue K	Clue L		Clue M	Clue N	Clue O	
				Clue P				
	Clue Q	Clue R	Clue S		Clue T	Clue U	Clue V	
	Clue W		Clue X				Clue Y	
		Clue Z	Clue a					Clue b
					Clue c	Clue d		Clue e

Denise Fuji McCleary May 2008

A	$\ln e^{9}$	Q	$\int_{-3}^{4} dx$
B	$8x^{\tan 0}$	R	$\int_{-1}^{1} 3x^{2} dx$
C	$\lim_{x \to \frac{\pi}{4}} 5\tan x$	S	$\lim_{x \to 3} \frac{x^{2}-9}{x-3}$
D	$\int_{0}^{\sqrt{7}} 2x\ dx$	T	$\lim_{x \to \infty} \frac{2-9x^{2}}{5-x^{2}}$
E	$\int_{-1}^{0} 3\ dx$	U	$\int_{0}^{\frac{\pi}{4}} \sec^{2} x\ dx$
F	$\frac{d}{dx}[\pi + 6x]$	V	First Odd Prime Number
G	$\int_{0}^{\frac{\pi}{2}} 3\cos x\ dx$	W	$\frac{d}{dx}\left(4x^{2}\right)$ at $x = 1$
H	$\frac{d}{dx} \sin x$ at $x = 0$	X	$\int_{1}^{e} \frac{dx}{x}$
I	$\frac{d}{dx} \tan(9x)$ at $x = 0$	Y	$\int_{1}^{e^{7}} \frac{dx}{x}$
J	$\frac{d}{dx}\left(9x + e^{2}\right)$	Z	$\frac{d}{dx}\ 6x$
K	$\int_{0}^{1} 10x\ dx$	a	$\int_{0}^{\frac{\pi}{2}} 4\sin(2x)\ dx$
L	$3\sin^{2}\theta + 3\cos^{2}\theta$	b	$\int_{0}^{-1} 10x\ dx$

M	$\int_0^2 2x^3 dx$	c	$\int_0^{\pi} \sin x \ dx$
N	$\frac{d}{dx}\left[\sin 7x\right]$ at $x = 2\pi$	d	$f'(0)$ if $f(x) = 9\sin x$
O	$\int_0^1 36x^5 \ dx$	e	$\int_{-1}^2 2x \ dx$
P	$e^{\sin 2\pi}$		

Limits [Calculus] Sudoku

Directions:
Solve the following list of clues [A through Z]. Place the numerical values of your answers in the block which corresponds to the clue. Then have fun solving the Sudoku.

This Sudoku is based on the May 18th Sudoku from The Daily Sudoku.

Clue A	Clue B					Clue C	Clue D	
Clue V				Clue W	9		Clue H	Clue I
			5			4		
	Clue E	Clue F		Clue G	5		2	
Clue J	Clue K		2		Clue L		Clue M	Clue N
	Clue O		9	7		Clue U	Clue S	
		Clue T			Clue P			
Clue Y	Clue R		6	8				Clue Z
	Clue Q	Clue X					4	6

Denise Fuji McCleary May 2008

5	9	3	4	2	6	8	1	7
1	4	7	8	3	9	6	5	2
5	4	9	8	1	6	3	2	7
7	3	8	1	6	5	9	2	4
9	6	1	2	4	3	5	7	8
4	5	2	9	7	8	5	7	8
6	7	4	3	9	2	1	8	5
2	1	5	6	8	4	7	9	3
3	8	9	7	5	1	2	4	6

SOME CALCULUS SONGS

Lyrics by Denise Fuji McCleary
For all my Calculus songs go to:
http://homework.zendog.org/songsfall2004.html
http://homework.zendog.org/captainofusub.pdf
http://homework.zendog.org/DiffEQsong.pdf

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THE DERIVATIVE SONG [Sung to the tune of Happy Birthday to You]
One prime two plus two prime one
One prime two plus two prime one
I just did the product rule,
That means I am Cool!

The quotient rule I need to know
Low d high less high d low
Draw a line then there below
Put the square of the low.

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CHAIN RULE SONG [Sung to the tune of America the Beautiful]

The Chain Rule is not hard to do
We need to sub a "u"
The "u" is just the inside of
Composite "f of u"
We'll multiply f prime of u
Times du/dx , Hence,
dx of f of g of x is
Found with diligence!

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How about a song from *Calculus the Musical!*
"Differentiabul"
(In the style of : They Might Be Giants - Istanbul(Not Constantinople))

f of x plus h minus f of x all over h as h drops to zero
is the formula to find the derivative
to otherwise state the instantaneous rate.
f of x plus h minus f of x all over h as h drops to zero
is the formula to find the derivative
to find the slope at one point.

Infinitesimals dy over dx,
Why he wrote it out that way,
Leibniz just liked it better that way,

So,
f of x plus h minus f of x all over h as h drops to zero
is the formula to find the derivative,
Now Hooke will be coming with a rope…
Newton found the limit of the slope.

Infinitesimals dy over dx.
Why he wrote out that way …
Leibniz just liked it better that way!

f of x plus h minus f of x all over h as h drops to zero
is the formula to find the derivative,
Now Hooke will be coming with a rope…
Newton found the limit of the slope.

For more about Calculus the Musical! including how to purchase the cd go to:
http://calculusthemusical.com/calculus-the-musical/

My Slope Field Movie Script D.F. McCleary

Scene 1
Room 222
Ms. McCleary's body is on the floor. Her giant slide rule is next to her body and she appears to be dead and is clutching a TI calculator in her cold, dead hand.
Detective Elvis [DE] and his assistant, Officer Elliot [OE] enter the room

DE: Oh my! It appears that someone has killed Ms. McCleary. Officer Elliot, check for a pulse.
OE: I'm not touching her, you check.
DE: I'm not touching her!

Female student [FS] enters the room and screams.

FS: Oh my! Did someone kill Ms. McCleary?
DE: That's what I said!

Female student checks for pulse

FS: Yes, she's dead. Look, she is holding her beloved calculator.
DE: Well, it looks like we will have to pry her calculator from her cold, dead hands. Officer Elliot, get the calculator.
OE: I'm not touching her!
DE: Well, I'm not touching her either.
FS: I'll get it. [Gives both guys a look of contempt, then retrieves the TI]
DE: Let me see that calculator. [Looks at calculator] It appears that the victim has left a clue. The calculator screen says"dy/dx=x+y". [Shows calculator to camera]
OE: Oh! I think I know who might be responsible.
DE: You think you know or you know?
OE: Well, …
FS: I think the person who killed the victim was a member of the notorious SF305 gang. You know, that gang who has slope fields "tats".
DE: Hmm! I think the SF305 gang is behind this heinous crime.
FS: I just said that.
DE: Officer Elliot, go round up the gang members. I think I know how to figure out who committed the murder.
OE: Sure thing, Detective Elvis!

Scene 2 [Need four "gang members" with slope field "tattoos" as listed in script]
Members of the SF305 gang are lined up in front of Detective Elvis and Officer Elliot.

DE: I have brought here because I know that one of you is responsible for the death of that crazy Calculus teacher, Ms. McCleary. I just need to see your tattoos.

SF gang starts protesting and complaining.

DE: Enough whining! Roll up your sleeves!

SF gang rolls up sleeves and form a line.

DE: Officer Elliot, help me out here. I was absent that month that we covered slope fields in Calc class.
OE: No problem. I got an A on that chapter test.

Officer Elliot and Detective Elvis go up to the first gang member and look at his tattoo. [Close up on the tattoo]

DE: Ah ha! You are the killer!
PE: Not so fast, Detective Elvis. This is the slope field for dy/dx=x/y. See the vertical and horizontal segments? [Points to the horizontal segments]
DE: I knew that. I was just testing you. Let's check the next suspect.

Officer Elliot and Detective Elvis go to the next suspect. [Close up on the tattoo]

DE: Ah ha! You are the killer!
OE: No! This is the slope field for dy/dx = x. See how the columns are all the same?
DE: Of course, I knew that. Let's check the next suspect.

Officer Elliot and Detective Elvis go the next suspect. [Close up on the tattoo]

DE: Ah ha! You are the killer!
OE: Close but not close enough. This is the slope field for dy/dx=x-y. We're looking for dy/dx=x+y.
DE: Well, we only have one more suspect. Kind of feels like one of those multiple-choice AP questions.
OE: It's possible it could be one of those "None of these" answers.
DE: I always hated those questions.
OE: Me too. We need to check the last suspect.

Officer Elliot and Detective Elvis go to the last suspect. [Close up on the tattoo]
DE: Well…
OE: [Stares at the tattoo for a moment] Detective Elvis, we have found our killer. His tattoo is the slope field for dy/dx=x+y
DE: I knew that! [Turns to suspect] You are under arrest for the fatal attack on the AP Calculus teacher. We are going to put you away for a long time.
OE: Hey! I finally got an opportunity to use my vast knowledge of Calculus to solve a crime.
DE: I think that the record will show that I solved the crime!
OE: Whatever…

[End of movie, roll credits]

Handouts from the following websites:

Bingo
http://www.doe.virginia.gov/Div/Winchester/jhhs/math/lessons/calculus/bingo1.html
http://www.mathingo.com/

Math Puzzles:
http://www.armoredpenguin.com/crossword/Data/best/math/calculus.01.html

Calculus Word Search:
http://www.free-online-word-search-puzzles.com/calculus.htm

Calculus Clue Game:
http://www.mastermathmentor.com/mmm/calc/default.aspx?page=Clue

Nasco's Calculaughs:
http://www.enasco.com/product/TB21904T

More puzzles:
http://www.aabp.com/CALCULUSPOTPOURRI.pdf