

GAS Leak

Genuinely Approachable Sudoku from the CtC Discord
Volume 9: November 14, 2021 - December 3, 2021



The winter holidays are nearly here, and that marks our first six months of GAS! Our sister project GAPP has grown a ton over the last few weeks, and now has over 500 solvers of its own, alongside 2,000 GAS solvers. Recent days also brought the unofficial World Sudoku Championship - but also, the sudoku contest known as PANFOPCWHTTAPA, which was some GAS solvers' first foray into competition. Congratulations to everyone who took part in either - and as always, thank you all for your kindness and your enthusiasm. You're what makes puzzles fun. :)

This volume of GAS Leak collects days 161 to 180 of GAS, along with three bonus puzzles that didn't make the regular rotation. Time standards, and a table of this round's dinosaur names, appear on the last page of this document. Happy solving!

- *Clover*

November 14, 2021: Say Eight!

Philip Newman

[Today's dose of intro silliness is brought to you by comedian Brian Regan, with advice on pain management.](#)

(CW: If you're squeamish about medical conditions, this may not be the video for you. Have a 🍍 instead!)

More [Pain]Killer Sudoku today!

Normal rules apply. Digits in cages cannot repeat and must sum to the total given.

8					8			8
		8					8	
8			8			8		
8		8			8	8	8	
								8
8		8			8		8	
8	8			8				8
	8				8			
			8			8		

Play on f-puzzles: <https://f-puzzles.com/?id=yjkykk3n>

Play on CTC App: <https://tinyurl.com/scybh8>

November 15, 2021: GAS 101 - Windoku

Clover

If you remember Philip's X-Sums GAS 101 lesson from a few weeks ago, then you know what's coming. Today's GAS is designed to be solvable without learning the Windoku Trick **TM** , but it's much easier and more fun if you do know it. (Windoku rules: Normal sudoku rules apply. Each 3x3 square extra region (with a dashed outline) must contain each digit from 1 to 9 once each.)

So, if you're already in the know, or if you like your GAS extra-spicy, go right ahead and solve! Everybody else should read [this short document about the terrible secret of windoku before starting](#).

Editor's note: the document is reproduced on the next few pages of this GAS Leak.

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

f-puzzles: <https://f-puzzles.com/?id=yfz5szwm>

CtC: <https://tinyurl.com/2j6akzkh>

Penpa: <https://git.io/J1kUk>

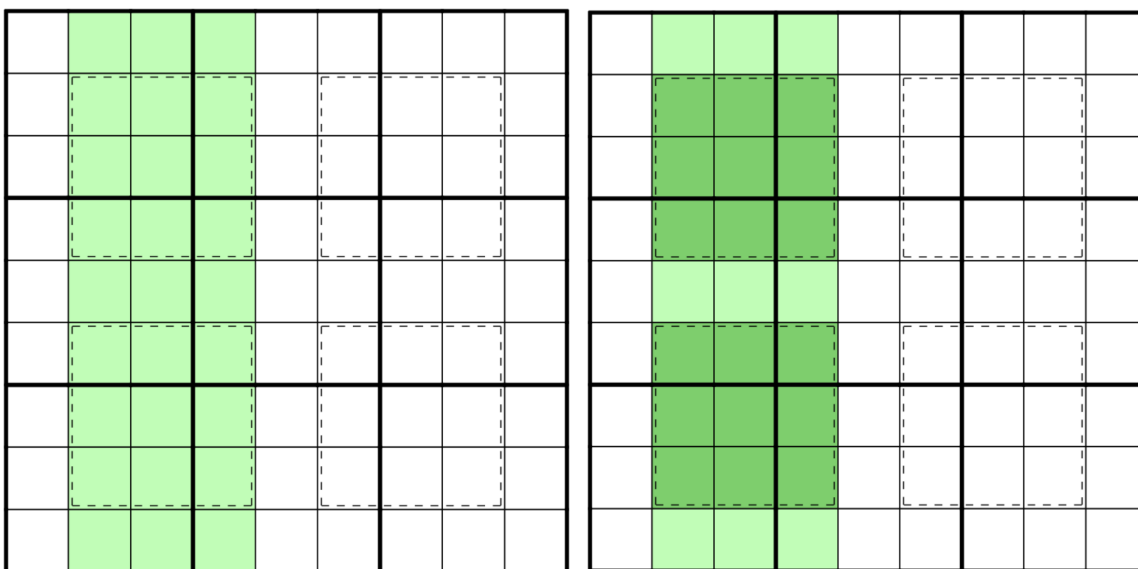
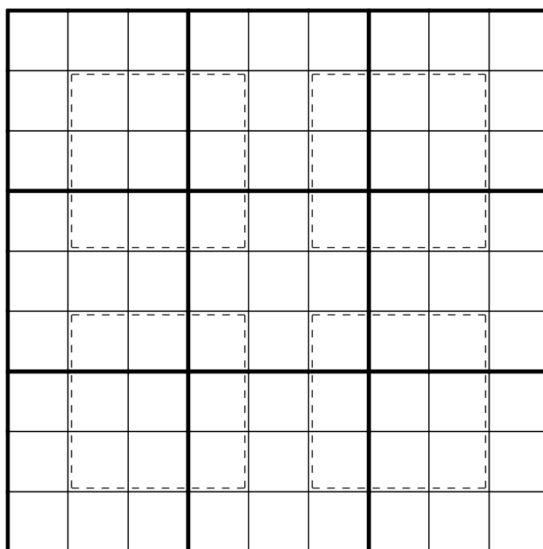
GAS 101: Windoku

Windoku is a sudoku variant including four additional square regions, as shown to the right.

Each of these regions must contain the digits 1 through 9 with no repeats.

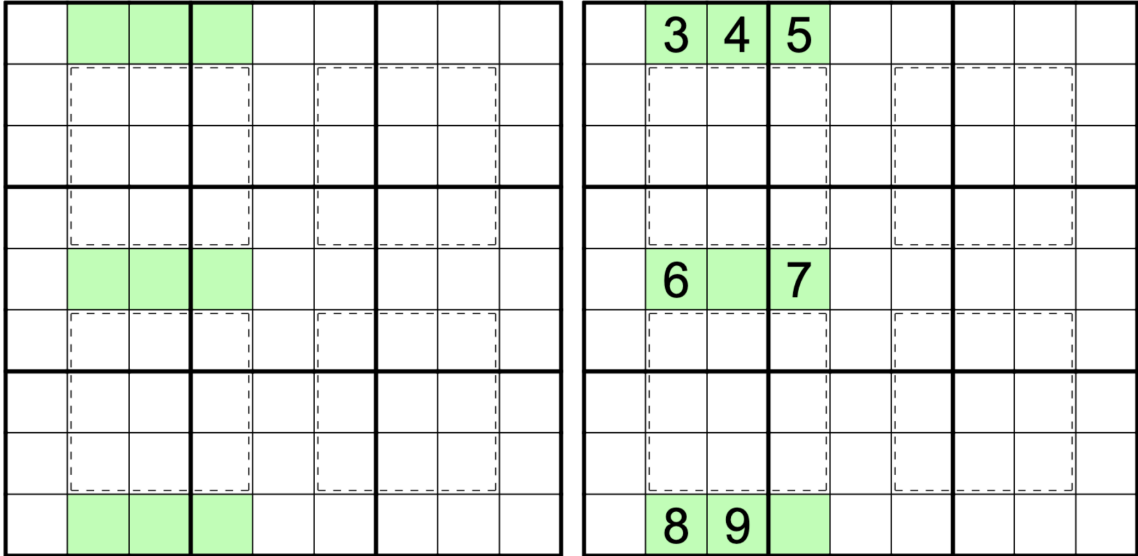
Some windokus, including today's GAS, are designed to be solved using a trick that's specific to this variant. Here's an example of how it works:

The three columns highlighted in green have to include three copies of the digits from 1 through 9. (That's because each column has to contain each digit exactly once, and the highlighting covers three columns.) The highlighted columns completely overlap two of the extra regions, which are shown in dark green. Together, those two extra regions contain *two* copies of each digit.

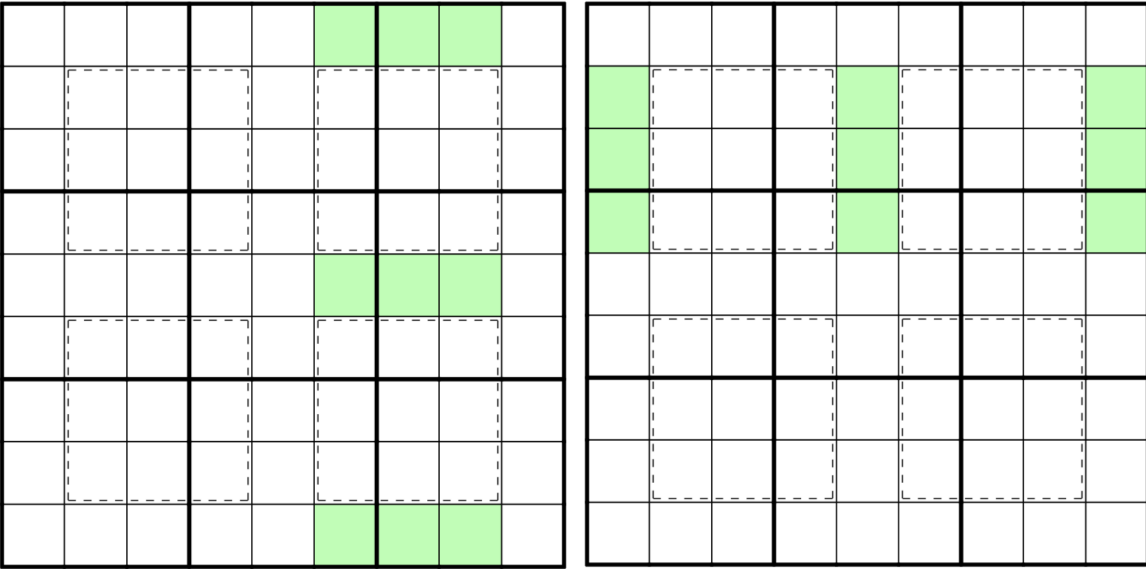


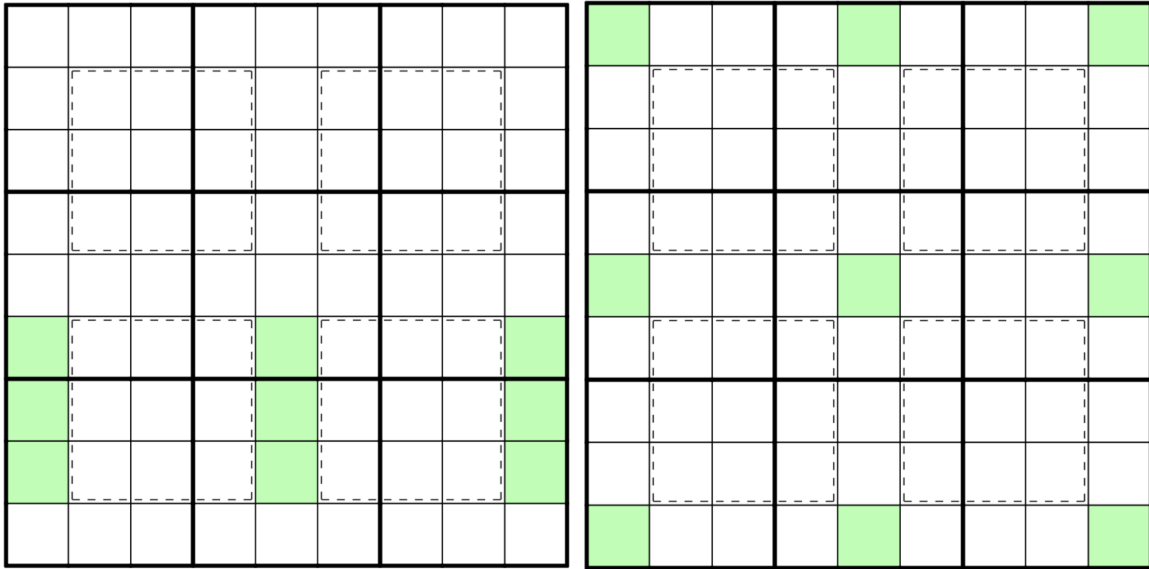
So, if you remove the dark green cells from your highlighting, you end up with *exactly one of each digit*.

So, if you see something like this in a windoku puzzle, for example, then the two missing green digits form a 1/2 pair:



These green cells are sometimes referred to as a **hidden region**. Here are the other hidden regions in windoku. Each of these regions contains the digits 1 through 9 exactly one time each.





(For practice, see if you can figure out how to prove the last one!)

Today's GAS is designed to be easier and more fun if you use this windoku trick, even though it's solvable without it. Try it out!

November 16, 2021: Fortress

Sam Cappleman-Lynes

Today's GAS is a Fortress Sudoku, but I've done my best not to make it as impenetrable as the name sounds! This variant has been used in competitions for many years, and my most memorable encounter with it was watching some top solvers solving a tricky one during the live playoffs of the World Sudoku Championship in 2018. Simon also solved that puzzle on the channel, and the link to the video is [here](#), if you want to try your hand at it after the GAS.

In this variant, normal Sudoku rules apply. Additionally, wherever a shaded cell and an unshaded cell are adjacent, the shaded cell must contain a larger value than the unshaded cell.

	< _ >	6	8	1	3		5	< _ >
7								
< ^ >			< ^ >				< ^ >	
		< ^ >	6	< ^ >	< ^ >		8	2
< ^ >				< ^ >				< ^ >
2	6		< ^ >	< ^ >	7	< ^ >		
	< ^ >				< ^ >			< ^ >
								8
< ^ >	2		9	4	1	6	< ^ >	

f-puzzles - <https://f-puzzles.com/?id=28c9ye3n>

CtC - <https://tinyurl.com/nwm3y2w>

November 17, 2021:

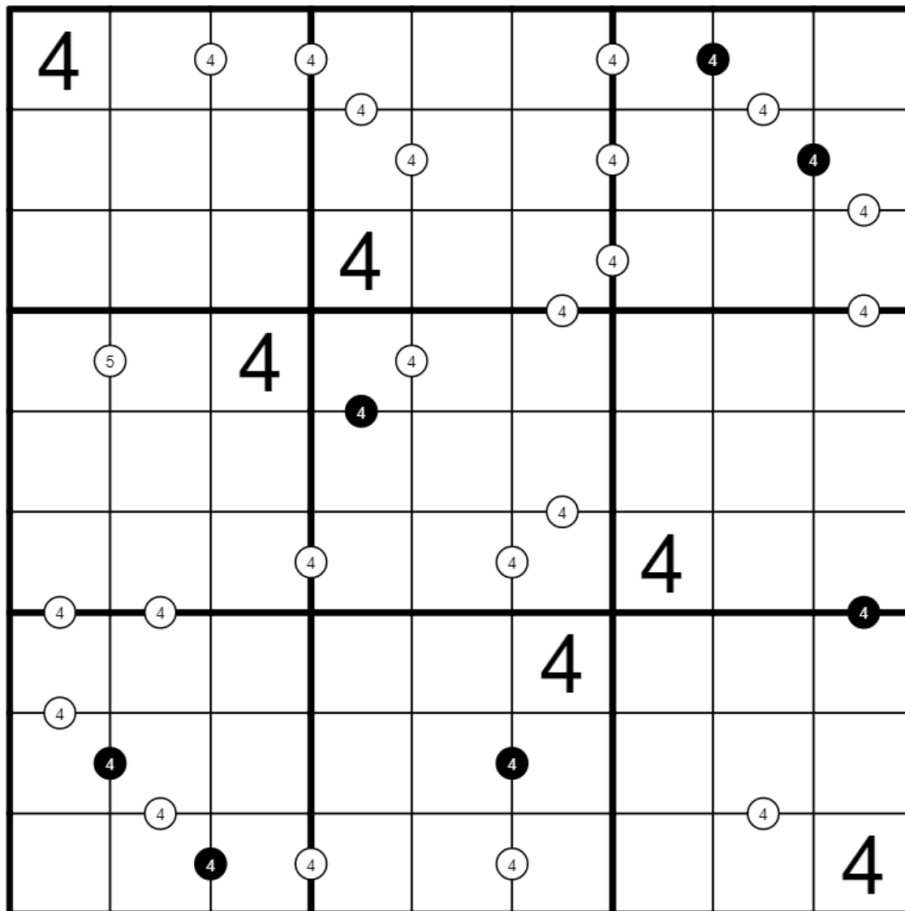
Fourshadowing / That's Three In The Corner / Two Clever By Half

Philip Newman

What's better than one GAS? How about ~~the same GAS three times~~ THREE unique and original puzzles, TWO of which are GAS?! Being stuck in bed has left me lots of time to try silly ideas like this Difference/Ratio Sudoku Trio!

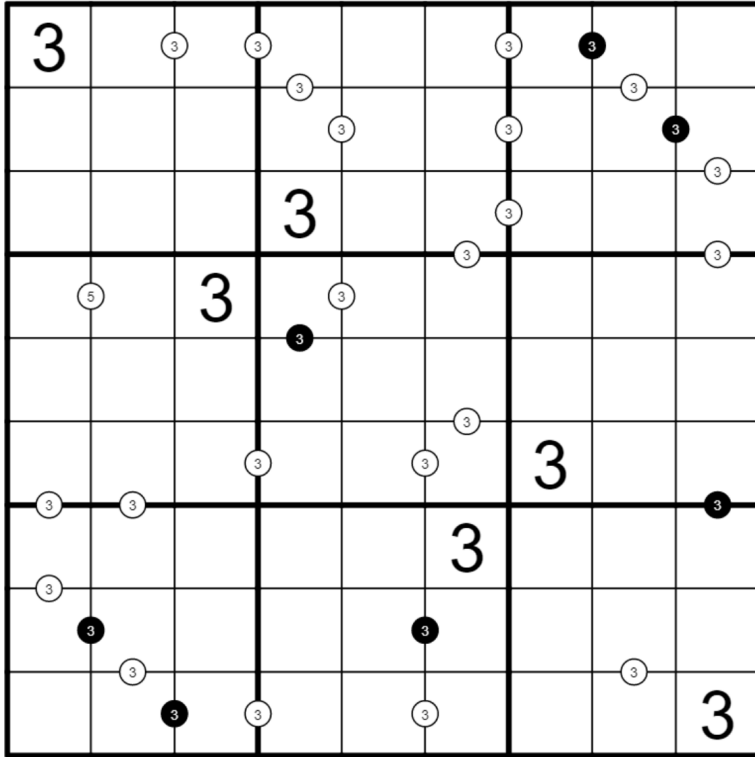
Normal sudoku rules apply. Digits in cells separated by a black dot must have the ratio given; digits in cells separated by a white dot must have the difference given. (Be mindful of the lone 5 dot!)

Editor's note: all three versions of the puzzle are reproduced on the following pages, with links to solve online. The party hat times only apply to the first two puzzles (combined); the third puzzle is a bit tougher and has no time standard.



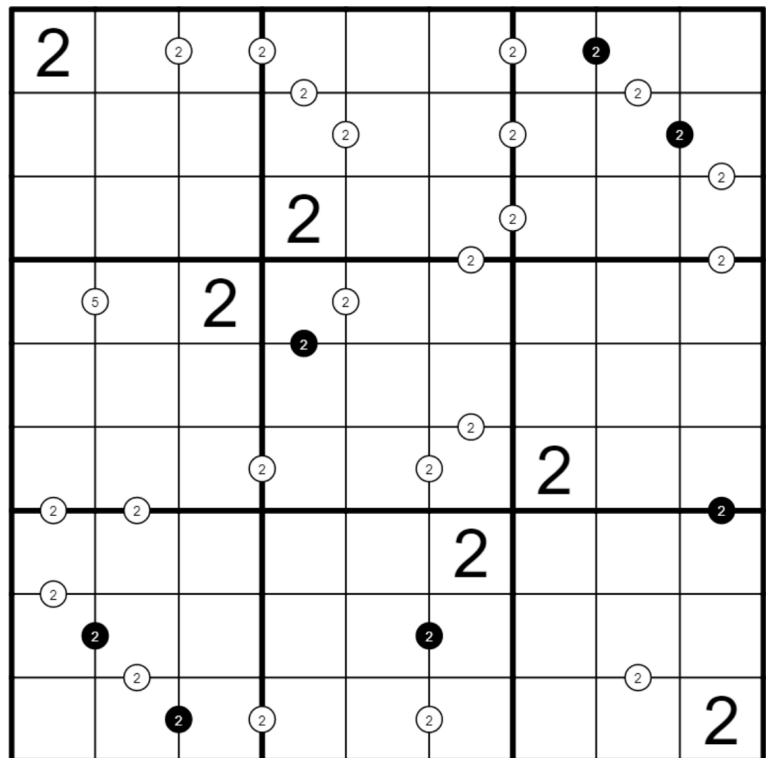
Play on f-puzzles: <https://f-puzzles.com/?id=yhxc4vdp>

Play on CTC App: <https://tinyurl.com/5n543vv2>



Play on f-puzzles: <https://f-puzzles.com/?id=ygqsl9pd>

Play on CTC App: <https://tinyurl.com/xh8jvks>



Play on f-puzzles: <https://f-puzzles.com/?id=yzkumo2m>

Play on CTC App: <https://tinyurl.com/567ra4pm>

November 18, 2021: World's Smallest Puzzle Hunt

Clover

The world's smallest bird is the bee hummingbird, with the same approximate weight as two human fingernails. The world's smallest rideable bicycle is the Smalltoe, with a saddle height of 65 millimeters. And the world's smallest puzzle hunt is today's GAS!

In all three grids, normal 6x6 sudoku rules apply.

The left grid is a classic sudoku: normal rules apply, and that's it!

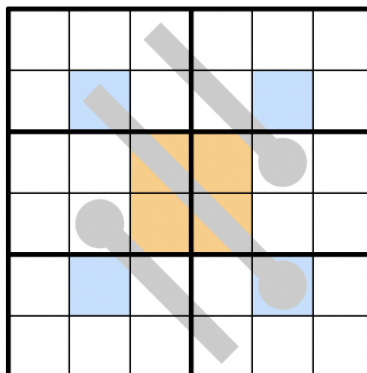
The central grid is a thermo sudoku: digits along a thermometer strictly increase (not necessarily consecutively!), starting at the round bulb.

The right grid is a killer sudoku: digits in a cage may not repeat and must sum to the value indicated.

Blue cells contain exactly the same digits in the same order in the left and center grids. Orange cells contain exactly the same digits in the same order in the center and right grids. (Note for colorblind solvin' friends: shaded cells that appear in the same position in the two grids have the same color; for instance, r3c3 is orange in both the center and right grids.)

Editor's note: the puzzles are shown here as they were originally presented; I've also included larger, separate versions on the following page for folks who like to print these puzzles.

	2				
1			3		
		4			
			1		
		5			2
				4	



					8
	8		8		
8	8		8		

Penpa: <https://git.io/J12cU>

	2				
1			3		
		4			
			1		
		5			2
				4	

					8
	8		8		
8	8		8		

November 19, 2021: Tiny Puzzle Hunt

Sam Cappleman-Lynes

You've been spoiled by my fellow GAS setters. Three puzzles in one day, not just from Philip Wednesday but also from Clover yesterday too! Well, not wanting to disappoint you and not wanting to carve a niche for myself as your least favourite GAS setter who only ever gives you one puzzle at a time, I'll complete a Trio of Trios with three more puzzles from me today.

Similarly to yesterday, today's puzzle consists of three 6x6 variant Sudokus. The variants are as follows:

Left grid - Arrow Sudoku. Digits along an arrow must sum to the number written in the adjoining circle.

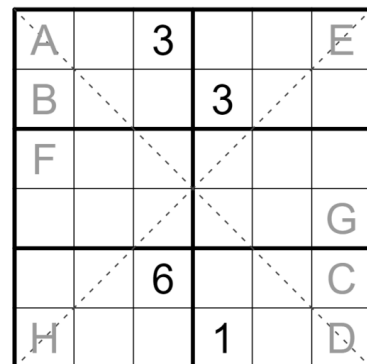
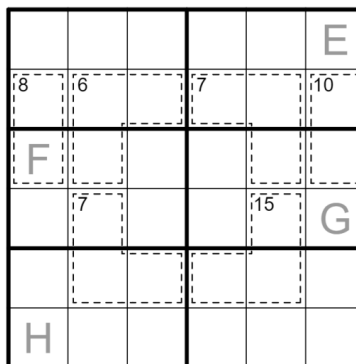
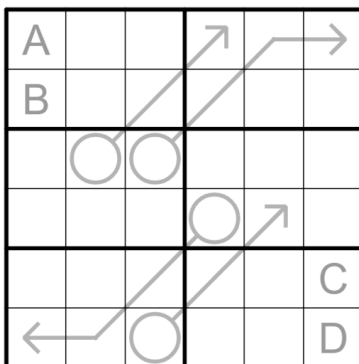
Middle grid - Killer Sudoku. Digits in a cage cannot repeat and must sum to the indicated total.

Right grid - Diagonal Sudoku. Digits on each main diagonal cannot repeat.

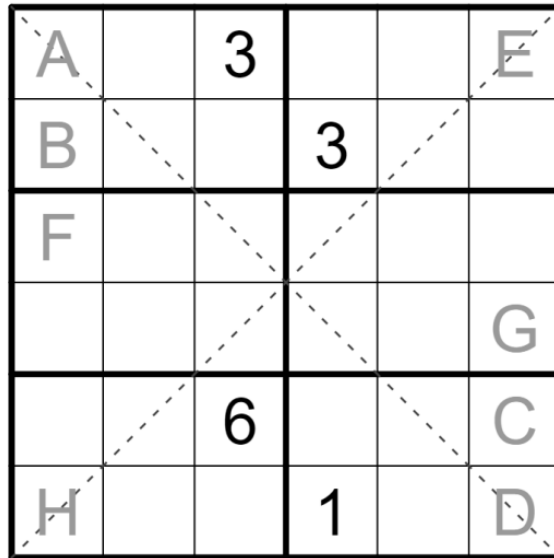
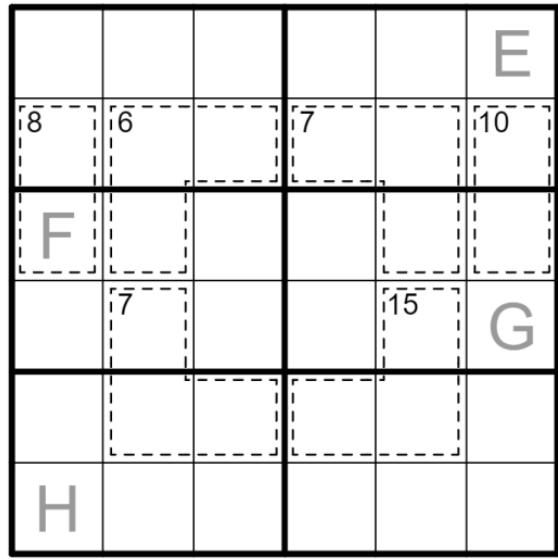
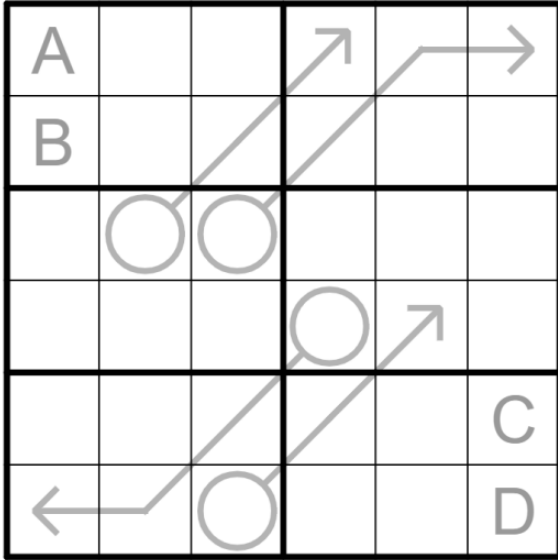
In addition to those rules, some cells in the grids have uppercase letters written in them. If two cells contain the same letter, then those cells must contain the same digit in the final solution.

Warning! Unlike yesterday, these puzzles cannot be solved in sequence one at a time. None of these puzzles has a unique solution in isolation. They must be solved simultaneously, and you will need to visit each grid multiple times throughout your solve.

Editor's note: the puzzles are shown here as they were originally presented; I've also included larger, separate versions on the following page for folks who like to print these puzzles.



Penpa: <https://git.io/J1KYQ>



November 20, 2021: [GAS WARS](#)

Philip Newman

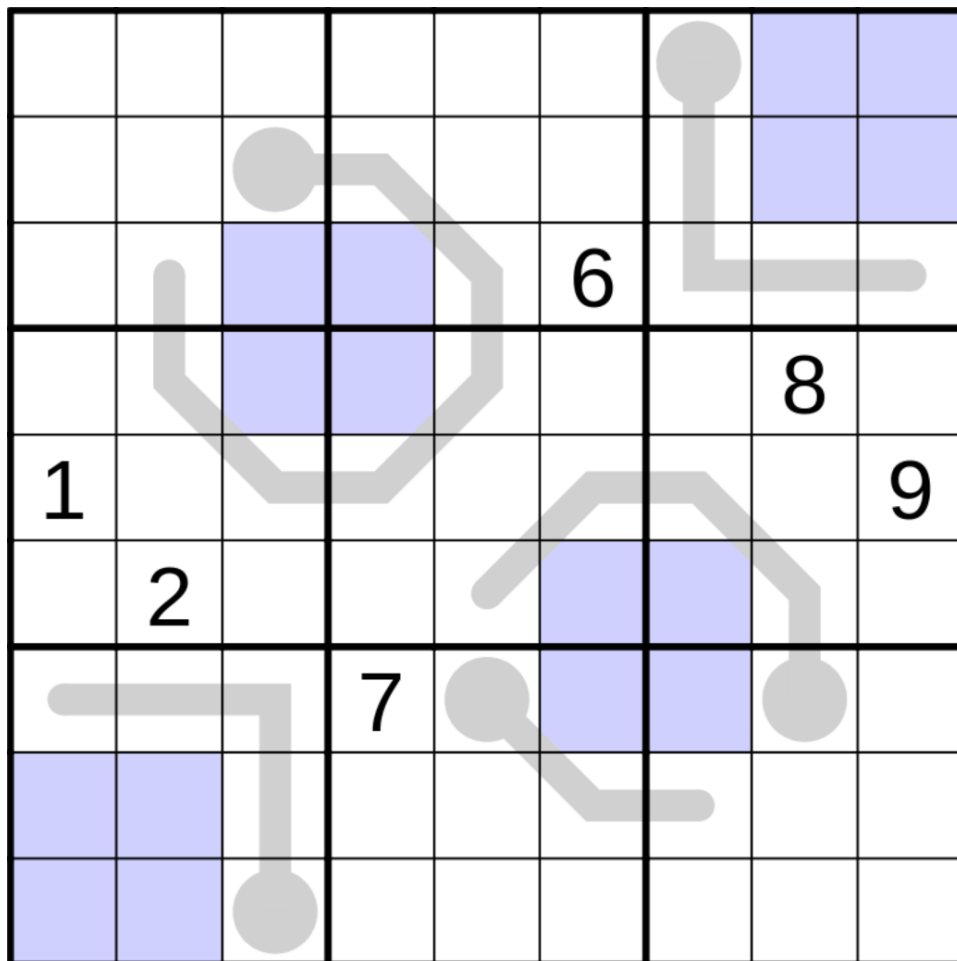
Episode CLXVII

PHILIP finally posts the puzzle! While distracted by cells of opposition spread across multiple galaxies, solvers are confronted with an old threat's reemergence, reminding solvers that digits can be the same in cells within a single puzzle.

CLOVER and SAM dispatch secret agents to prevent the release of a different puzzle, because it's TOO HARD.

Meanwhile, Supreme Leader BAKPAO hasn't revealed the number of parsecs required to join the ORDER OF THE ROTATING EGG...

Today's GAS is a Thermo Clones Sudoku! Normal sudoku rules apply. Blue regions are clones, and must contain the same digits in the same relative positions. Digits along thermometers must strictly increase from bulb to tip.



Play on f-puzzles: <https://f-puzzles.com/?id=yz9ry7vd>

Play on CTC App: <https://tinyurl.com/v844n3ee>

November 21, 2021: Irregular Frame

Clover

If you have any highly irregular pictures on hand, I have an irregular frame you may be interested in! This is a variant I saw for the first time during this year's world sudoku championship, which ends today (I did not win.) Solve it, hang it on your wall, and adjust it whenever it gets a bit crooked. 😊

Normal irregular sudoku rules apply: each row, column, and irregular 9-cell region must contain the digits 1 through 9 once each. Also, a value outside of the grid tells you the sum of all of the digits up to the first region border. For instance, the "9" above the rightmost column tells you that the topmost three digits in that column sum to 9.

			7	9			15	9	
6				6					
				9			1		
					9	1			14
			8		3				
15			1	7					
	3			6					
					5				8
	7	15			8	9			

f-puzzles: <https://f-puzzles.com/?id=yz4eg8uw>

CtC: <https://tinyurl.com/sp3s343d>

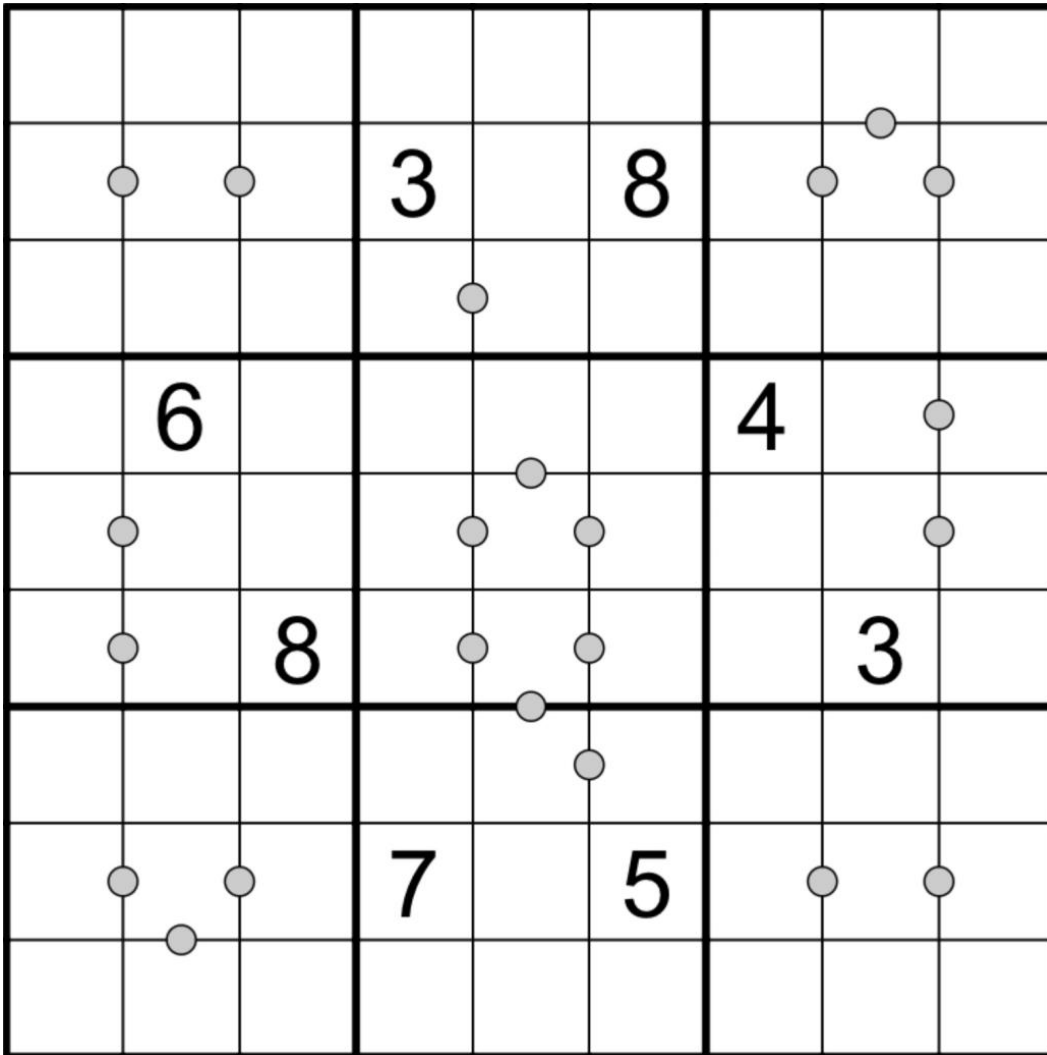
November 22, 2021: Answer 8

Sam Cappleman-Lynes

There are those who will tell you that the answer is 42 (never mind what the question is). Well, in this Sudoku, the answer is 8, and it's up to you to find the question!

In this Answer 8 Sudoku, normal Sudoku rules apply. Whenever two cells are separated by a grey dot, then the digits in those cells must be able to produce the answer 8 using one of the four basic arithmetic operations. If two cells are not separated by a dot, then this may or may not be the case.

A little hint from me - it would be a good use of your time to work out what the possible pairs are before starting the puzzle!



f-puzzles: <https://f-puzzles.com/?id=yt33btwj>

CtC: <https://tinyurl.com/4s4h555v>

November 23, 2021: Thing of Shapes

Philip Newman

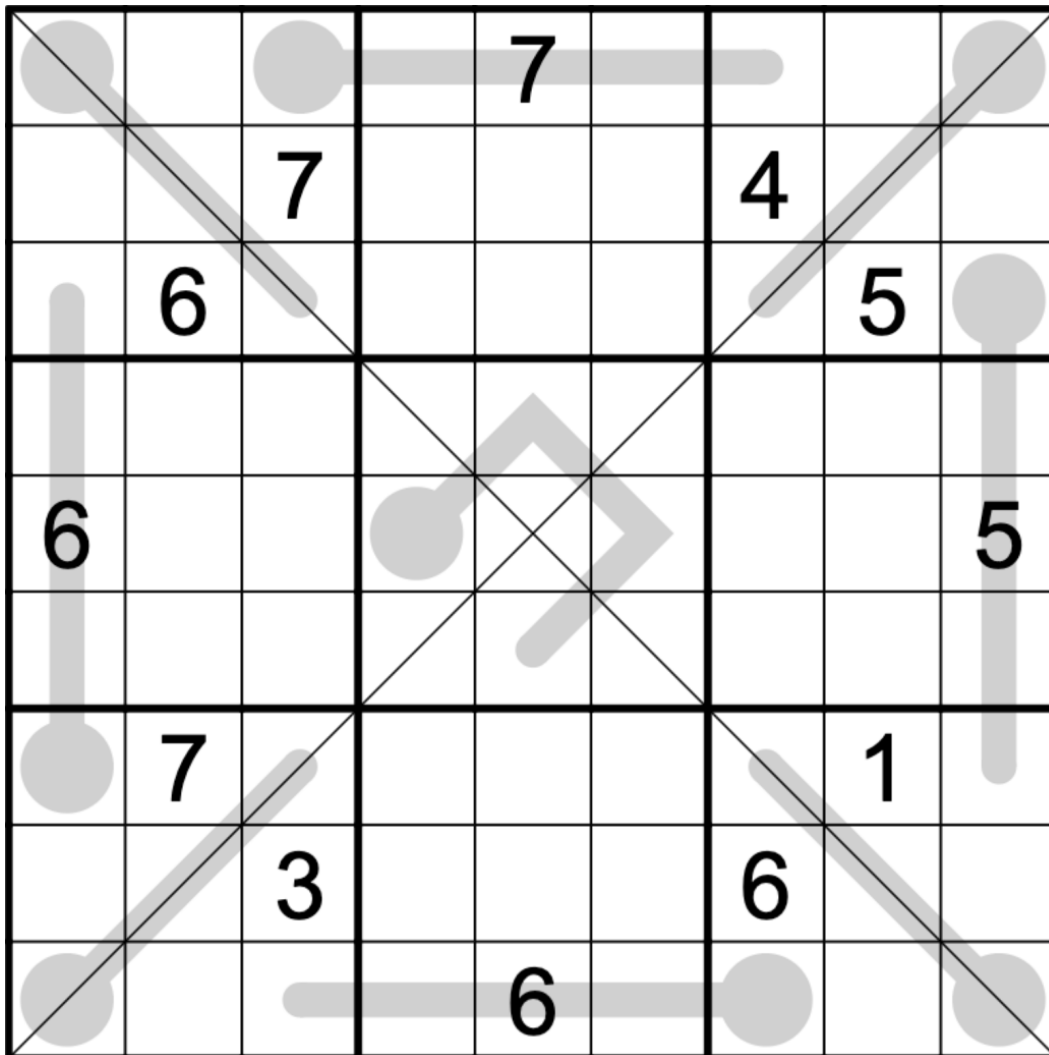
We have a bit of a mishap at Groovy Attractive Setters, Inc. - one of my kids who will remain nameless snuck into the Office Of Puzzle Setting. While they were there, they accidentally dropped a shape sorting toy into the big vat of primordial puzzle parts, and this was the result.

Fortunately, it solves uniquely and nicely, so it's today's GAS, a Thermo Sudoku X!

Normal sudoku rules apply.

Normal thermo rules: Digits along thermometers must strictly increase from bulb to tip.

Normal diagonal/sudoku X rules: Digits cannot repeat on the marked diagonals.



Play on f-puzzles: <https://f-puzzles.com/?id=yhxf4vqt>

Play on CTC App: <https://tinyurl.com/z3ce74mc>

November 24, 2021: Quad Max

Clover

Today's GAS is a Quad Max Sudoku.

No, not that kind of quad max sudoku. Quadriceps Maximillian, Esq. is quite happy in #daily-pencil-puzzle-discussion and won't be bothering us any more! But you see, we were recently contacted by the World Sudoku Committee of Not Accidentally Repurposing Sudoku Variant Names (WSCNARSVN), who let us know that quad max is already a thing and it actually looks like this.

Normal sudoku rules apply. Also, each arrow points to the largest digit in the four cells surrounding it. (The largest digit always appears only once in the four cells; smaller digits, however, may repeat as long as sudoku rules allow it.)

I set and tested today's GAS on camera, with commentary. If you're down for a slightly-less-than-1-hour video, click [here](#).

Editor's note:

- 'Quadriceps Maximillian' refers to a character who appeared in the intros of the original set of Quad Max puzzles. If you want to check out those puzzles, they appear in GAS Leak Volume 6!
- #daily-pencil-puzzle-discussion is the (at the time, new) discussion channel for GAPP.
- WSCNARSVN doesn't really exist, and no, nobody is mad at us. But we did actually steal an existing variant name by accident!

November 25, 2021: Classic

Sam Cappleman-Lynes

Thanks for joining me today, on this totally ordinary Thursday on which nothing special is happening at all. Since today is a completely ordinary day, it's only fitting that I give you a completely ordinary Sudoku.

Today's GAS is a Classic Sudoku, which means that normal Sudoku rules apply, and that's it! If you're in the market for some inside information about this puzzle before solving it, then make sure you read the title!

Editor's note:

- If you follow the online solving links, you'll notice that this puzzle has the title "Easy As 1, 2, 3."
- This puzzle was originally published on Thanksgiving Day in the US, or Totally Ordinary Thursday in the rest of the world.

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

f-puzzles: <https://f-puzzles.com/?id=ctypy2e3>

CtC: <https://tinyurl.com/25kkcrfn>

November 26, 2021: Summoning Baphomet

Philip Newman

They said I was tampering with forces behind the understanding of a mere mortal. They warned me not to cross the streams. But did I heed their warnings?

No.

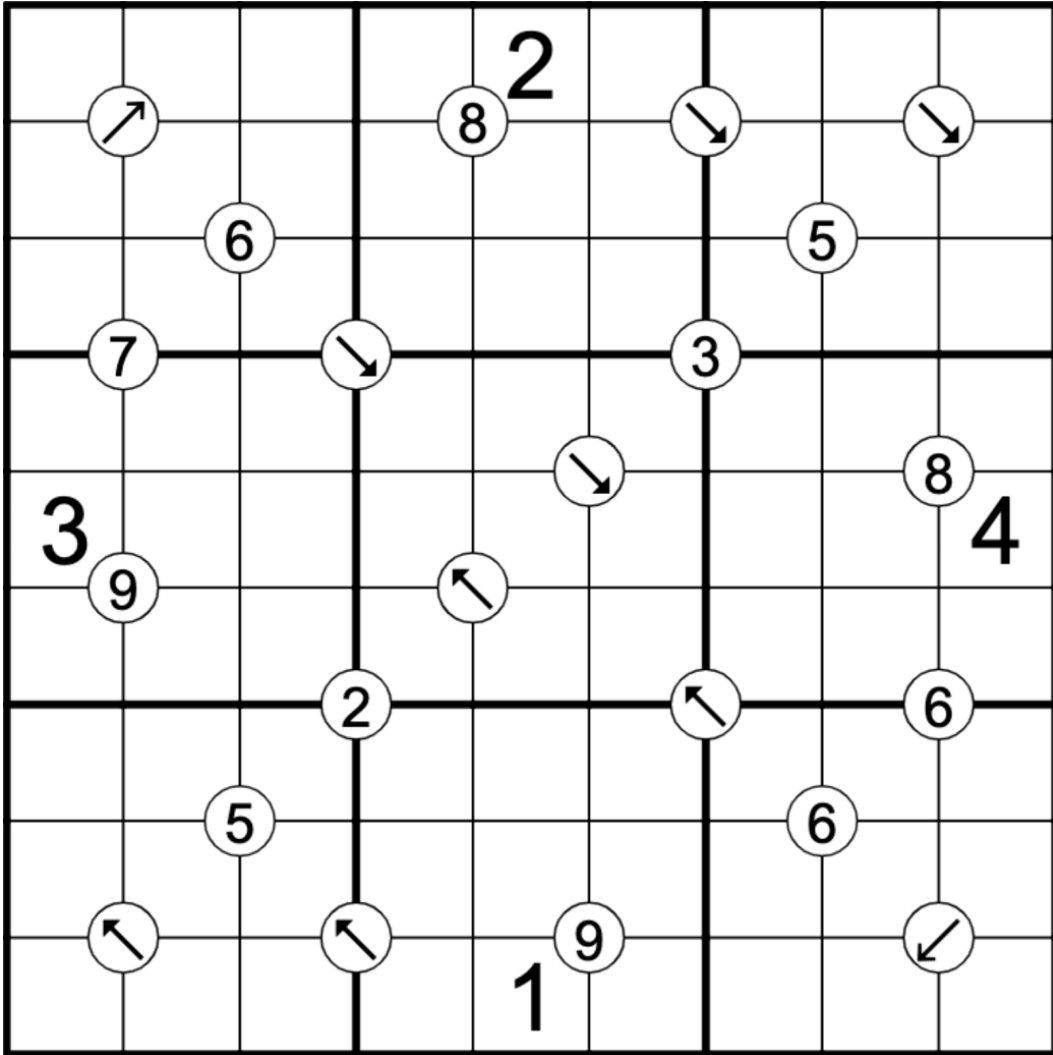
Now the sky has turned red, and it's raining firemen. Rivers have turned to blood, and Ash Ketchum covers the ground. The sound of ominous chanting comes from everywhere and nowhere. It is truly the end of the world. (Or it's just Black Friday.)

Today's Genuinely Apocalyptic Sudoku is an unholy pairing Quad Max and "Quad Max" Sudoku! As you may recall from the day before yesterday's perfectly ordinary Thursday puzzle, we inadvertently called a variant "Quad Max" despite that already being a thing. Naturally, I had to use both types in one puzzle, because I'm a monster.

Normal sudoku rules apply.

A value in a white circle shows the largest digit that appears in the four cells surrounding that circle. (Digits around a white circle with a value, including the largest value, may repeat as long as they follow sudoku rules.)

An arrow in a white circle points to the uniquely largest digit in the four cells surrounding it. (Smaller digits may repeat as long as they follow sudoku rules, but the largest digit must only appear in the cell pointed to by the arrow.)



Play on f-puzzles: <https://f-puzzles.com/?id=yytjk6fw>

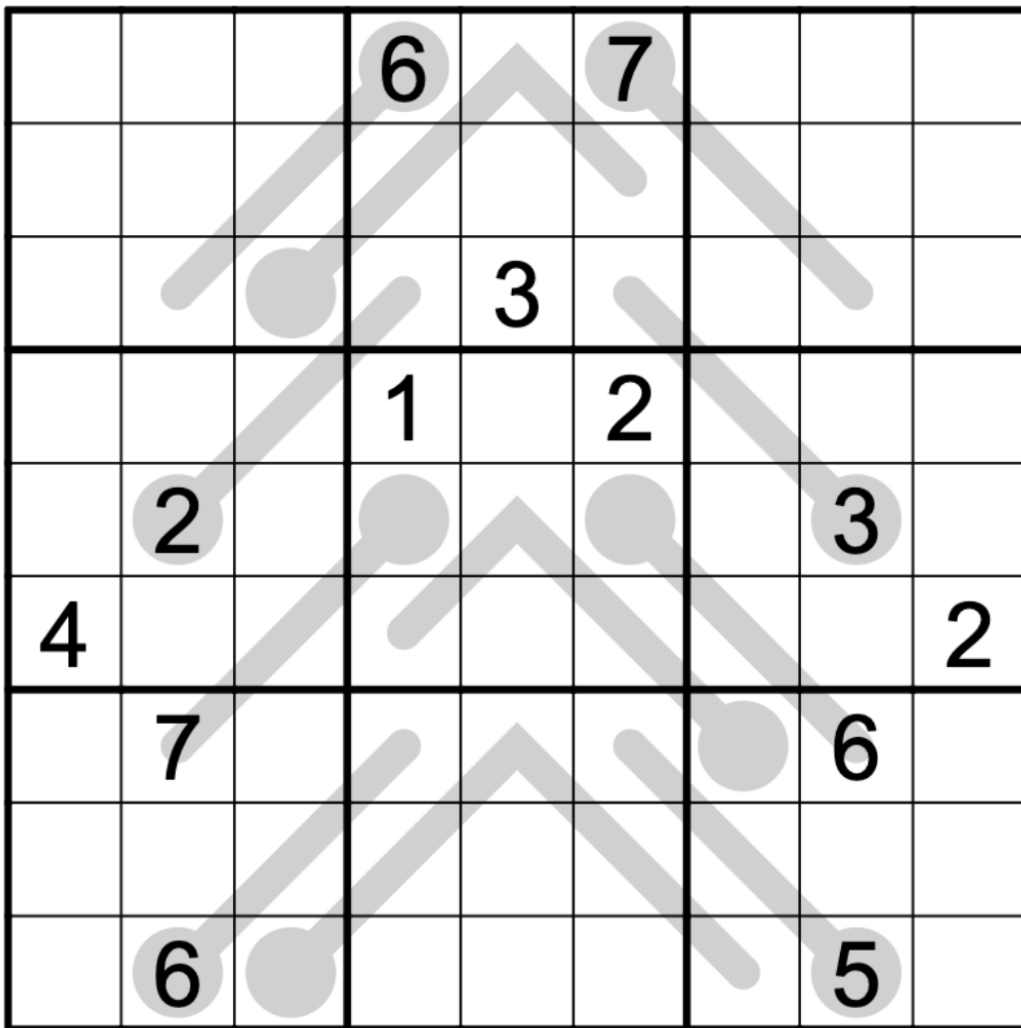
Play on CTC App: <https://tinyurl.com/yc34zmun>

November 27, 2021: Thermo

Clover

It's the weekend after Completely Ordinary Thursday, and so holiday tradition dictates that we put up our Absolutely Unremarkable Winter Tree. I saw someone on Pinterest decorate theirs with digits instead of ornaments, so I thought I'd try it myself. 🌲 🤔

Normal sudoku rules apply. Digits along a thermometer must strictly increase, starting at the round bulb (but are not necessarily consecutive!).



f-puzzles: <https://f-puzzles.com/?id=y3mllibu>

CtC: <https://tinyurl.com/mshjcs58>

Penpa: <https://git.io/JMZZt>

November 28, 2021: Irregular

Sam Cappleman-Lynes

Good afternoon, Sudoku solvers! Thank you for subscribing to F-f-f-f-facts, where we will provide you with hourly updates consisting of fascinating facts about the letter F! Here are some fancy fings to fink about, first and foremost.

- F is the sixth letter of the English alphabet, and the 12th least frequently used in natural English language.
- The letter f is commonly used in mathematics to denote an arbitrary function.
- The letter F is often used on the Internet to pay respects, both mockingly and genuinely, thanks to a viral meme originating with the 2014 video game Call of Duty: Advanced Warfare
- Sudoku normally doesn't contain the letter F, but today's GAS has 8 of them!

In this Irregular Sudoku, place a digit from 1 to 9 into each empty cell so that every row, column and bold outlined region contains each digit exactly once.

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

f-puzzles: <https://f-puzzles.com/?id=y2f7nzfa>

CtC: <https://tinyurl.com/4vfdtwam>

Penpa: <https://git.io/JMIZ2>

November 29, 2021: Paying Respect

Philip Newman

Today's Killer GAS is once again brought to you by the letter F. Here are some words that start with F:

Forgot - Sam Forgot to clean up after himself and left the letter F scattered everywhere on the GAS Factory Floor.

Four - Four starts with F. Eight does not. What was Sam thinking yesterday?

Five - Five also starts with F. But not Eight. Weren't you on Countdown, Sam? You should know how to spell Eight.

Foot - Did you know I had Foot surgery recently? I didn't Fail to mention that, did I?

Normal sudoku rules apply. Digits in cages cannot repeat and must sum to the total given.

		3		8	7			
			9			10		
14	15			7				4
					2			
11		4				6	9	
16			8					6
		10		3		5		
				12	1			
		13			17			

Play on f-puzzles: <https://f-puzzles.com/?id=y3ysruej>

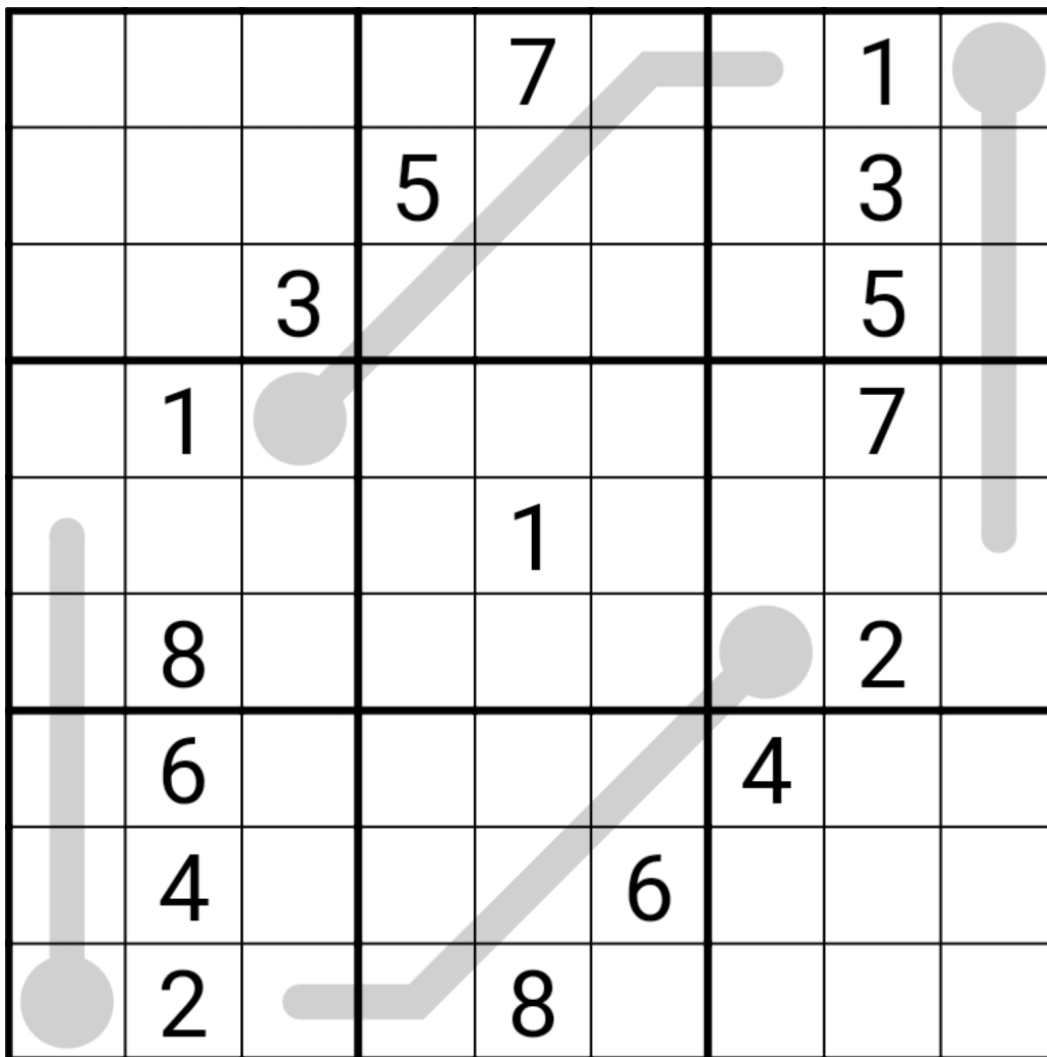
Play on CTC App: <https://tinyurl.com/y9x45ycd>

November 30, 2021: Thermo

Sam Cappleman-Lynes

Clover and I have done a little switcheroo and she'll be back with tomorrow's puzzle. It falls to me to give you something today!

In honour of the frankly mind-boggling 15 degrees C increase in temperature overnight where I live, today's puzzle is another Thermo Sudoku. That means that, as well as normal Sudoku rules, digits along each thermometer shape must strictly increase, starting at the bulb end.



f-puzzles: <https://f-puzzles.com/?id=yyv4ecvt>

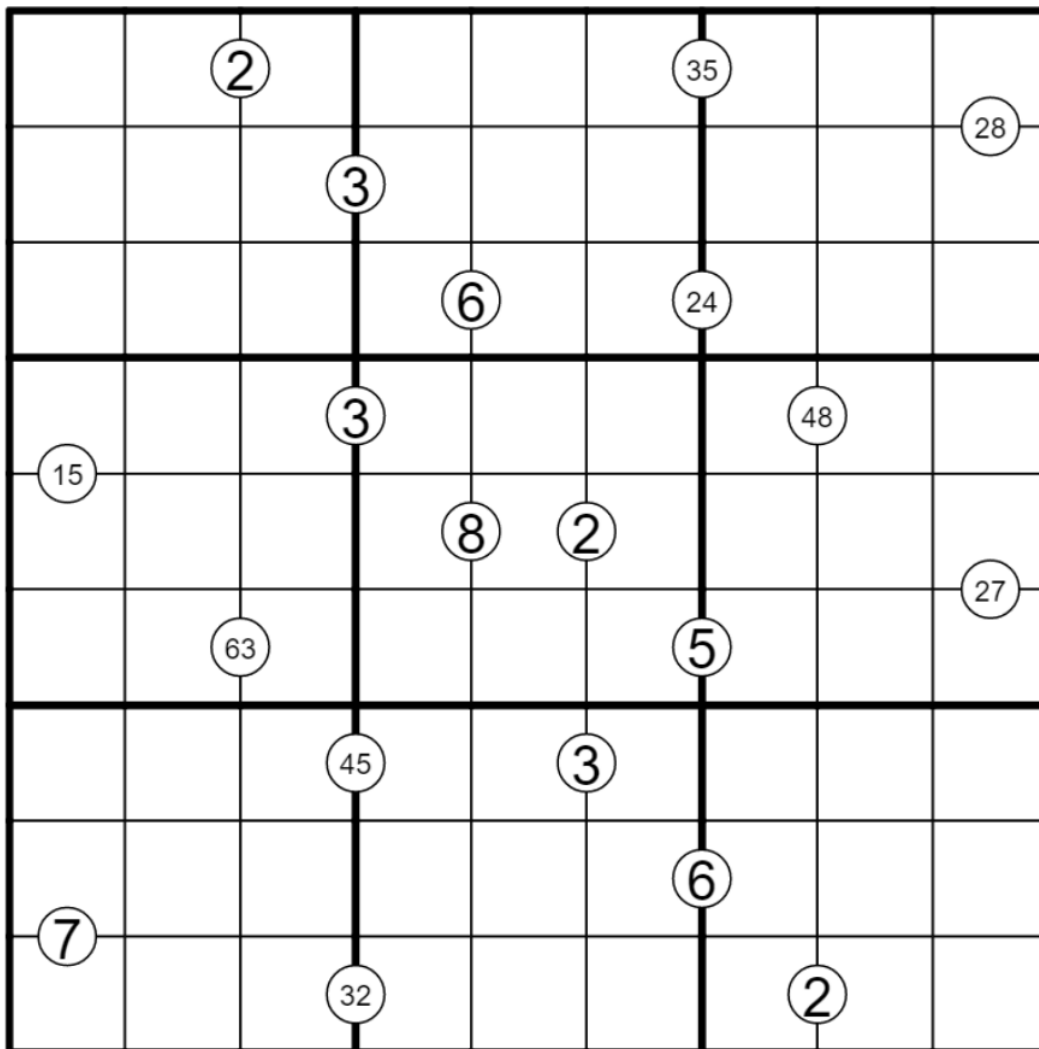
CtC: <https://tinyurl.com/bnzd2vyx>

December 1, 2021: Product

Clover

Today's GAS is a product sudoku. The product of all of the digits in the correct solution to this sudoku is 10911068841557131648034489935589408558284800000000. Feel free to make use of this fact in your solve. 🤔

Normal sudoku rules apply. Also, a value in a white circle shows the product of the digits in the two cells adjacent to that circle. That's it! Now go forth and multiply. ✖



f-puzzles: <https://f-puzzles.com/?id=y6m7petj>

CtC: <https://tinyurl.com/3a636mdf>

Penpa: <https://git.io/JMrc7>

December 2, 2021: Asking for a Friend

Philip Newman

Presenting: The Sudoku Which Teaches You Sudoku Labelling Conventions!

This is a (hopefully very gentle) intro to Friendly Cells, a constraint which restricts the digits that can appear in a cell based on their position in the grid. A past GAS Leak puzzle used them, but since we've had a few friendly cell puzzles in the archive recently I thought it would be worth doing a regular GAS with them.

Normal sudoku rules apply. Green cells are "friendly": the digit in a friendly cell matches the row-, column-, or box- number (possibly two or even all three of these, but at least one). Rows are numbered starting from 1 at the top; columns are numbered starting from 1 at the left; and box numbers are:

123

456

789

					2	3		
		1						
					5		6	
		4						
7					8	9		

Play on f-puzzles: <https://f-puzzles.com/?id=y5q682lm>

Play on CTC App: <https://tinyurl.com/yckpuaxx>

December 3, 2021: Greater Than
Clover

Today's puzzle is a gift for a very special friend of GAS, bakpao. In the spirit of the holidays, I thought I'd let him know that he's greater than all of the other bakpaos by sharing this Greater Than sudoku! I wasn't going to set this variant, but he's mentioned it so often that I figured it must be his very favorite!

Normal sudoku rules apply. Also, there are some inequality signs in the grid, which must correctly indicate which of the digits next to them is the greater of the two. (For instance, if "<" appears between two cells, then you could fill those cells as "3 < 4" or "5 < 9." The alligator mouth eats the larger digit!)

1	4	7				>	>	>
	>	<		>	<			
	>	>	>			3	6	9
2					6			
	1			3			2	
			5					7
7	6	5						
^				v			v	
	>	<		>	<		>	<
		^		^				v
						5	7	6

f-puzzles: <https://f-puzzles.com/?id=y69gztvd>

CtC: <https://tinyurl.com/4fdnh64f>

Bonus 1: XV (-)

Sam Cappleman-Lynes

Normal sudoku rules apply. Digits on either side of a V sum to 5. Digits on either side of an X sum to 10. **All possible Xes and Vs are given (that is, this puzzle includes a negative constraint.)**

	X				X			
			X				X	
	V				V			
			V				V	
	7				6			
	6		9		8		7	
	3		5		7		6	
			6				8	

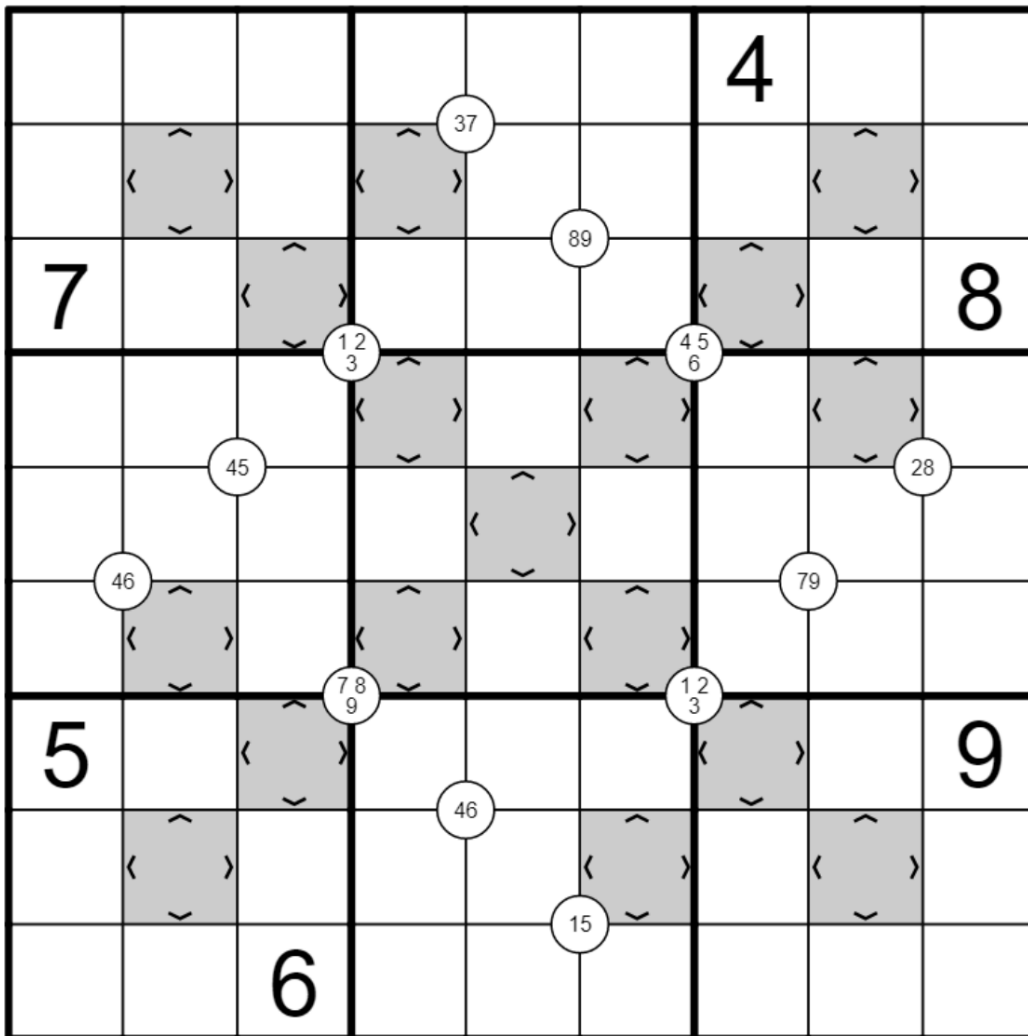
f-puzzles: <https://bit.ly/3EnJHoD>

CtC: <https://bit.ly/3piCrEi>

Bonus 2: Fourtress

Philip Newman

Normal sudoku rules apply. Digits in circles must appear in (at least) one of the four surrounding cells. Digits in grey cells are larger than their orthogonally adjacent neighbors.

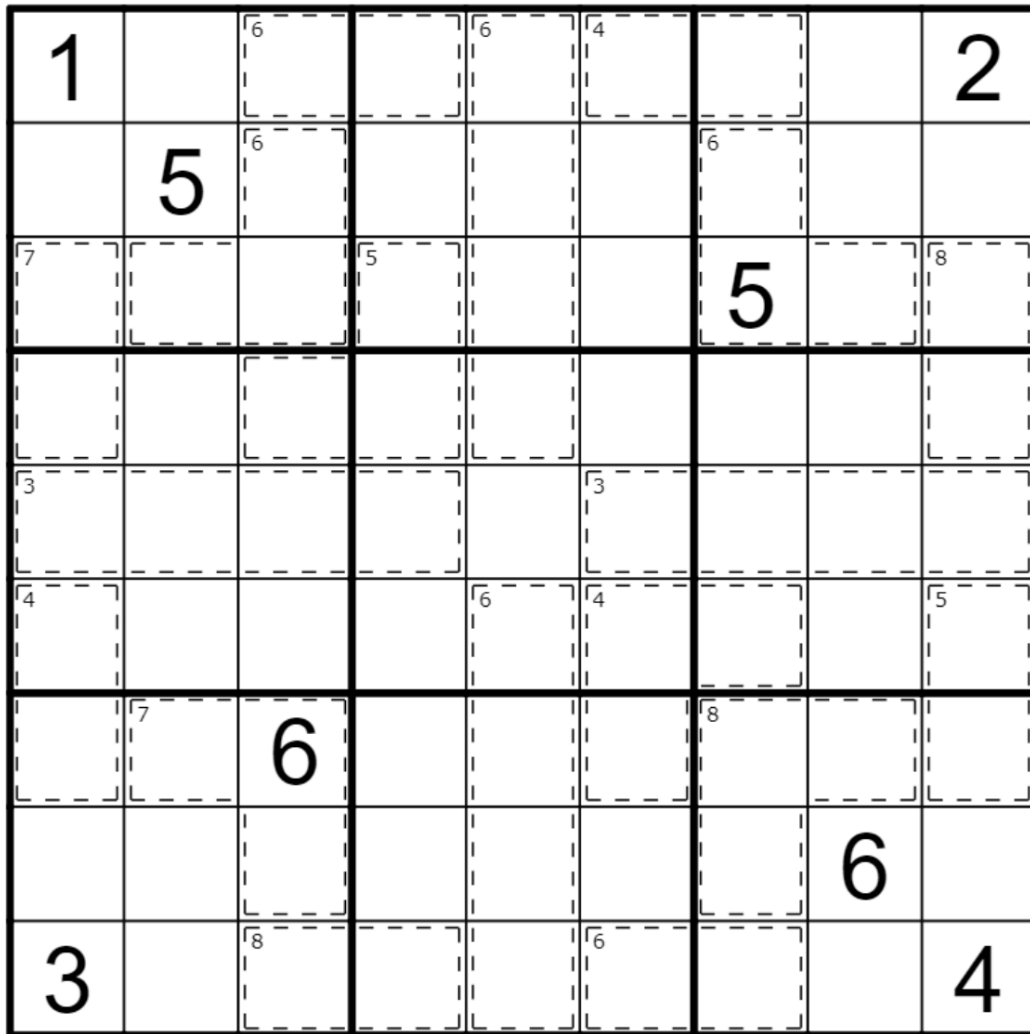


f-puzzles: <https://bit.ly/3ljhP7G>
CtC: <https://tinyurl.com/2p8h2nj7>

Bonus 3: Cage Range

Clover

Normal sudoku rules apply. The small value in the top left corner of a cage indicates the difference between the largest digit and the smallest digit in that cage. Digits may not repeat in a cage.



f-puzzles: <https://bit.ly/3GcmZ3i>

CtC: <https://bit.ly/3xMTy52>

Time Benchmarks

	One party hat	Two party hats	Today's dinosaur:
14 Nov 2021	0:06:08	0:12:08	mighty morphine magyarosaurus
15 Nov 2021	0:07:00	0:12:00	knowledgeable nqwebasaurus
16 Nov 2021	0:08:30	0:14:00	fortified fulengia
17 Nov 2021	0:10:00 (first two puzzles combined)	0:20:00 (first two puzzles combined)	triple threat tangvayosaurus
18 Nov 2021	0:07:00	0:12:30	puzzled parasaurolophus
19 Nov 2021	0:10:00	0:16:00	triplicated talarurus
20 Nov 2021	0:07:00	0:13:00	galactic gondwanatitan
21 Nov 2021	0:07:00	0:12:30	iridescent iguanadon
22 Nov 2021	0:10:00	0:15:00	eightfold emausaurus
23 Nov 2021	0:07:30	0:15:00	shapely shunosaurus
24 Nov 2021	0:08:00	0:14:00	technically-correct tenontosaurus
25 Nov 2021	0:05:00	0:08:00	unexceptional udanoceratops
26 Nov 2021	0:08:30	0:16:00	doomsday datousaurus
27 Nov 2021	0:06:00	0:10:00	festive fruitadens
28 Nov 2021	0:06:30	0:10:00	funny-looking fukuivenator
29 Nov 2021	0:05:55	0:11:11	respectful rapetosaurus
30 Nov 2021	0:05:00	0:09:00	sweltering saurophaganax
1 Dec 2021	0:06:30	0:11:30	productive patagosaurus
2 Dec 2021	0:07:00	0:13:00	bellusaurus bestie
3 Dec 2021	0:07:00	0:13:00	eminent euhelopus