

Introducing the **Symmetry454** Calendar

A simple perpetual solar calendar that is symmetrical across and between equal quarters, having **4+5+4 weeks** per quarter, yet conserves the traditional 7-day week.

Home Page on the Web: <<http://www.sym454.org/>>

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Overview of the Symmetry454 Calendar

<http://www.sym454.org/>

4:5:4 Weeks per Month

Days	4 ↓	5 ↓	4 ↓	Weeks
91 →	Monday January	Monday February	Monday March	← 13
+91 →	Monday April	Monday May	Monday June	← +13
+91 →	Monday July	Monday August	Monday September	← +13
+91 →	Monday October	Monday November	Monday December	← +13

= 364 ← Total in Non-Leap Years → = 52

+7 → In a **Leap Year** append a **Leap Week** to December.
Leap years occur at symmetrically arranged intervals of 6 or 5 years. ← +1

= 371 ← Total in Leap Years → = 53

Symmetry454 Calendar — 3 by 4 design

<<http://www.sym454.org/>>

Note: 18 denotes the Mid-Quarter Day

January

week	Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	1	2	3	4	5	6	7
2	8	9	10	11	12	13	14
3	15	16	17	18	19	20	21
4	22	23	24	25	26	27	28

February

week	Mon	Tue	Wed	Thu	Fri	Sat	Sun
5	1	2	3	4	5	6	7
6	8	9	10	11	12	13	14
7	15	16	17	18	19	20	21
8	22	23	24	25	26	27	28
9	29	30	31	32	33	34	35

March

week	Mon	Tue	Wed	Thu	Fri	Sat	Sun
10	1	2	3	4	5	6	7
11	8	9	10	11	12	13	14
12	15	16	17	18	19	20	21
13	22	23	24	25	26	27	28

April

week	Mon	Tue	Wed	Thu	Fri	Sat	Sun
14	1	2	3	4	5	6	7
15	8	9	10	11	12	13	14
16	15	16	17	18	19	20	21
17	22	23	24	25	26	27	28

May

week	Mon	Tue	Wed	Thu	Fri	Sat	Sun
18	1	2	3	4	5	6	7
19	8	9	10	11	12	13	14
20	15	16	17	18	19	20	21
21	22	23	24	25	26	27	28
22	29	30	31	32	33	34	35

June

week	Mon	Tue	Wed	Thu	Fri	Sat	Sun
23	1	2	3	4	5	6	7
24	8	9	10	11	12	13	14
25	15	16	17	18	19	20	21
26	22	23	24	25	26	27	28

July

week	Mon	Tue	Wed	Thu	Fri	Sat	Sun
27	1	2	3	4	5	6	7
28	8	9	10	11	12	13	14
29	15	16	17	18	19	20	21
30	22	23	24	25	26	27	28

August

week	Mon	Tue	Wed	Thu	Fri	Sat	Sun
31	1	2	3	4	5	6	7
32	8	9	10	11	12	13	14
33	15	16	17	18	19	20	21
34	22	23	24	25	26	27	28
35	29	30	31	32	33	34	35

September

week	Mon	Tue	Wed	Thu	Fri	Sat	Sun
36	1	2	3	4	5	6	7
37	8	9	10	11	12	13	14
38	15	16	17	18	19	20	21
39	22	23	24	25	26	27	28

October

week	Mon	Tue	Wed	Thu	Fri	Sat	Sun
40	1	2	3	4	5	6	7
41	8	9	10	11	12	13	14
42	15	16	17	18	19	20	21
43	22	23	24	25	26	27	28

November

week	Mon	Tue	Wed	Thu	Fri	Sat	Sun
44	1	2	3	4	5	6	7
45	8	9	10	11	12	13	14
46	15	16	17	18	19	20	21
47	22	23	24	25	26	27	28
48	29	30	31	32	33	34	35

December

week	Mon	Tue	Wed	Thu	Fri	Sat	Sun
49	1	2	3	4	5	6	7
50	8	9	10	11	12	13	14
51	15	16	17	18	19	20	21
52	22	23	24	25	26	27	28
53	29	30	31	32	33	34	35

In a **Leap Year**, append a **Leap Week** to December, making it a 5-week month.
Leap years occur at symmetrically arranged intervals of 6 or 5 years.

Symmetry454 Calendar

<http://www.sym454.org/>

quad "stack" design, ordinal day numbers

Note: **18** denotes the Mid-Quarter Day

week	Mon	Tue	Wed	Thu	Fri	Sat	Sun
January	1 1	2 2	3 3	4 4	5 5	6 6	7 7
	8 8	9 9	10 10	11 11	12 12	13 13	14 14
	15 15	16 16	17 17	18 18	19 19	20 20	21 21
	22 22	23 23	24 24	25 25	26 26	27 27	28 28
February	29 1	30 2	31 3	32 4	33 5	34 6	35 7
	36 8	37 9	38 10	39 11	40 12	41 13	42 14
	43 15	44 16	45 17	46 18	47 19	48 20	49 21
	50 22	51 23	52 24	53 25	54 26	55 27	56 28
	57 29	58 30	59 31	60 32	61 33	62 34	63 35
March	64 1	65 2	66 3	67 4	68 5	69 6	70 7
	71 8	72 9	73 10	74 11	75 12	76 13	77 14
	78 15	79 16	80 17	81 18	82 19	83 20	84 21
	85 22	86 23	87 24	88 25	89 26	90 27	91 28

week	Mon	Tue	Wed	Thu	Fri	Sat	Sun
July	27 183 1	28 184 2	29 185 3	30 186 4	31 187 5	32 188 6	33 189 7
	34 190 8	35 191 9	36 192 10	37 193 11	38 194 12	39 195 13	40 196 14
	41 197 15	42 198 16	43 199 17	44 200 18	45 201 19	46 202 20	47 203 21
	48 204 22	49 205 23	50 206 24	51 207 25	52 208 26	53 209 27	54 210 28
August	55 211 1	56 212 2	57 213 3	58 214 4	59 215 5	60 216 6	61 217 7
	62 218 8	63 219 9	64 220 10	65 221 11	66 222 12	67 223 13	68 224 14
	69 225 15	70 226 16	71 227 17	72 228 18	73 229 19	74 230 20	75 231 21
	76 232 22	77 233 23	78 234 24	79 235 25	80 236 26	81 237 27	82 238 28
	83 239 29	84 240 30	85 241 31	86 242 32	87 243 33	88 244 34	89 245 35
September	90 246 1	91 247 2	92 248 3	93 249 4	94 250 5	95 251 6	96 252 7
	97 253 8	98 254 9	99 255 10	100 256 11	101 257 12	102 258 13	103 259 14
	104 260 15	105 261 16	106 262 17	107 263 18	108 264 19	109 265 20	110 266 21
	111 267 22	112 268 23	113 269 24	114 270 25	115 271 26	116 272 27	117 273 28
	118 274 29	119 275 30	120 276 31	121 277 32	122 278 33	123 279 34	124 280 35

week	Mon	Tue	Wed	Thu	Fri	Sat	Sun
April	125 92 1	126 93 2	127 94 3	128 95 4	129 96 5	130 97 6	131 98 7
	132 99 8	133 100 9	134 101 10	135 102 11	136 103 12	137 104 13	138 105 14
	139 106 15	140 107 16	141 108 17	142 109 18	143 110 19	144 111 20	145 112 21
	146 113 22	147 114 23	148 115 24	149 116 25	150 117 26	151 118 27	152 119 28
May	153 120 1	154 121 2	155 122 3	156 123 4	157 124 5	158 125 6	159 126 7
	160 127 8	161 128 9	162 129 10	163 130 11	164 131 12	165 132 13	166 133 14
	167 134 15	168 135 16	169 136 17	170 137 18	171 138 19	172 139 20	173 140 21
	174 141 22	175 142 23	176 143 24	177 144 25	178 145 26	179 146 27	180 147 28
	181 148 29	182 149 30	183 150 31	184 151 32	185 152 33	186 153 34	187 154 35
June	188 155 1	189 156 2	190 157 3	191 158 4	192 159 5	193 160 6	194 161 7
	195 162 8	196 163 9	197 164 10	198 165 11	199 166 12	200 167 13	201 168 14
	202 169 15	203 170 16	204 171 17	205 172 18	206 173 19	207 174 20	208 175 21
	209 176 22	210 177 23	211 178 24	212 179 25	213 180 26	214 181 27	215 182 28

week	Mon	Tue	Wed	Thu	Fri	Sat	Sun
October	220 274 1	221 275 2	222 276 3	223 277 4	224 278 5	225 279 6	226 280 7
	227 281 8	228 282 9	229 283 10	230 284 11	231 285 12	232 286 13	233 287 14
	234 288 15	235 289 16	236 290 17	237 291 18	238 292 19	239 293 20	240 294 21
	241 295 22	242 296 23	243 297 24	244 298 25	245 299 26	246 300 27	247 301 28
November	248 302 1	249 303 2	250 304 3	251 305 4	252 306 5	253 307 6	254 308 7
	255 309 8	256 310 9	257 311 10	258 312 11	259 313 12	260 314 13	261 315 14
	262 316 15	263 317 16	264 318 17	265 319 18	266 320 19	267 321 20	268 322 21
	269 323 22	270 324 23	271 325 24	272 326 25	273 327 26	274 328 27	275 329 28
	276 330 29	277 331 30	278 332 31	279 333 32	280 334 33	281 335 34	282 336 35
December	283 337 1	284 338 2	285 339 3	286 340 4	287 341 5	288 342 6	289 343 7
	290 344 8	291 345 9	292 346 10	293 347 11	294 348 12	295 349 13	296 350 14
	297 351 15	298 352 16	299 353 17	300 354 18	301 355 19	302 356 20	303 357 21
	304 358 22	305 359 23	306 360 24	307 361 25	308 362 26	309 363 27	310 364 28

In a Leap Year, append a Leap Week to December, making it a 5-week month.
Leap years occur at symmetrically arranged intervals of 6 or 5 years.

311 365 29	312 366 30	313 367 31	314 368 32	315 369 33	316 370 34	317 371 35
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Benefits of the Symmetry454 Calendar

<<http://www.sym454.org/>>

- The Symmetry454 calendar is perpetual — a permanent copy can be reused every year.
- It conserves the 7-day week.
There are no intercalated or “null” or leap days outside of the traditional 7-day weekly cycle.
- Its symmetrical structure paves the way to simpler, aesthetically pleasing calendar designs.
- Its **superior symmetrical leap rule** ensures excellent long-term astronomical accuracy:
 - The simple fixed arithmetic **52/293** leap rule has 52 leap years that are automatically and inherently symmetrically spread as smoothly as possible within each repeating cycle of 293 years:
 - **It is a Leap Year only if the Remainder of (52 × Year + 146) / 293 is less than 52.**
 - With this simple single-step leap rule, leap year intervals occur in groups of either 6 + 6 + 5 = 17 years or 6 + 5 = 11 years, which symmetrically group into sub-cycles of 17 + **11** + 17 = 45 years or sub-cycles of 17 + 17 + **11** + 17 + 17 = **79** years. In each full calendar cycle these sub-cycles inherently occur symmetrically in the sequence 45 + **79** + 45 + **79** + 45 = 293 years.
 - With 52 leap weeks in the cycle, and 52 weeks in a regular year, the fixed cycle length equals exactly 294 regular years, and the average interval between leap weeks is exactly 294 weeks.
 - The calendar mean year $\equiv 365 + \frac{71}{293} \text{ days} \equiv 365\text{d } 5\text{h } 48\text{m } 56 + \frac{152}{293}\text{s}$, which is intentionally slightly shorter than the present era northward equinoctial mean year of 365d 5h 49m 0s, ensuring essentially drift-free performance for more than 4 future millennia.
 - Due to the symmetrical arrangement of leap years, the timing of the mean northward equinox moment always falls at the cycle average in the first year of every 293-year cycle. **This feature simplifies astronomical performance evaluations.**
- **Every Symmetry454 year, quarter, month and week starts on Monday and ends on Sunday.**
- **Every day number within each Symmetry454 month is always on the same weekday in every month.**
- $\text{Weekday} = \text{DayInMonth} \text{ MOD } 7$, where 0=Sunday, 1=Monday, 2=Tuesday, *etc.*
- Monthly meetings on a fixed weekday are always on the same day number in every month, simplifying scheduling, for example the 3rd Thursday is always the 18th day of every month.
- Its symmetrical 13-week quarters are always identical.
Every quarter has the same count of weekdays and weekend days.
- Every date has permanently fixed week-in-year and day-in-year numbers, facilitating administrative, academic, commercial and industrial applications, and simplifying calendar arithmetic.
- There is always a whole number of weeks in every year (non-leap year = 52 weeks, leap year = 53 weeks), in every quarter (13 weeks), and in every month (short month = 4 weeks, long month = 5 weeks).
- **Every secular holiday, event, anniversary, birthday, and memorial day has a permanently fixed weekday and date, because the calendar is perpetual.**
- Holiday and/or special day overlaps are less likely to occur and are easy to predict and avoid.
- Sunday, April 7th is proposed as a permanently fixed Symmetry454 date for Easter, based on the median date of the Sunday after the day of the astronomical lunar opposition that is on or after the day of the astronomical northward equinox, calculated for the meridian of Jerusalem.
 - Fixing Easter also fixes all Easter-related ecclesiastical calendar dates (counted before or after Easter).
 - See “**Appendix**: A Declaration of the Second Ecumenical Council of the Vatican on Revision of the Calendar” at the end of the archive “[Constitution on the sacred liturgy Sacrosanctum Concilium solemnly promulgated by His Holiness Pope Paul VI on December 4, 1963](http://www.vatican.va/archive/hist_councils/ii_vatican_council/documents/vat-ii_const_19631204_sacrosanctum-concilium_en.html)” at <http://www.vatican.va/archive/hist_councils/ii_vatican_council/documents/vat-ii_const_19631204_sacrosanctum-concilium_en.html>.
- The first 4 weeks of every Symmetry454 month are identical.
Note: It is likely that some regular monthly payments will become two-tiered, with 25% more payable for long months. For monthly comparisons increase short month statistics by 25% to match long months, or reduce the long month statistics by 20%.
- The coherent structure of the calendar enables simple arithmetic expressions in calculating the following for statistical or business purposes: weekday; day number of year, quarter or month; week number of year, quarter or month; month number of year or quarter.
- **Symmetry454 calendar arithmetic is in the public domain**, allowing **royalty-free** computer implementation.
- The **freeware** *Kalendis* computer program demonstrates the calendar and inter-converts dates, and is freely available at <<http://www.sym454.org/kalendis/>>.
- “Friday the 13th” never happens.