Symmetry454 Calendar Birthdays, Anniversaries, Memorial Days, Holidays and Annual Events

- Annual events are permanently fixed (month, day, weekday)
- Rules for converting observation dates
- How the Symmetry454 Calendar helps avoid holiday “collisions”

Home Page on the Web: <http://individual.utoronto.ca/kalendis/>

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Which Leap Rule should one use to convert Gregorian to Symmetry454 dates?

Use the ISO standard leap rule when converting historical Gregorian dates and Gregorian birthdays or anniversaries to their corresponding Symmetry454 dates, even though the preferred 52/293 Symmetry454 leap rule is more accurate with respect to the northward equinox than the ISO leap rule, because the ISO leap rule maintains a consistent long-term relationship to the Gregorian calendar.

Which Symmetry454 and Gregorian holidays or events often coincide?

Holidays and events assigned to a specific weekday

Special days that are observed on a specific weekday, for example the 3rd Monday in a certain month, coincide between the Gregorian and the Symmetry454 calendars in the large majority of years.

Easter and Related Days

Early Christians defined Easter as occurring on the first Sunday after the first full moon after the northward equinox — the "*Paschal* moon" (so called because Easter used to be called "*Pascha*").

Atmospheric refraction makes objects (most notably Sun and Moon) near the horizons appear about $^1/_2°$ higher in the sky than their true geocentric positions. Topocentric lunar parallax (viewing Moon from the surface of Earth) makes Moon appear about 1° lower than its true geocentric position. Taken together, these effects essentially offset each other, so that we can say at non-polar latitudes that Moon is full if it is rising when Sun is setting, or if Moon is setting when Sun is rising, although it would not often happen that these events coincide so closely in time. To allow for variable timing, we can say that at non-polar latitudes if the Moon rise/set is within about 30 minutes of the Sun set/rise, respectively, then there will not be another Moon rise/set that is closer to full Moon during that lunar cycle.

The actual full moon moment is observationally best defined as the maximum of a lunar eclipse, regardless of where in the sky the observer sees it. The moment of the true astronomical maximum is observationally difficult to determine without instrumentation, however, because that is the moment of minimum distance between the center of Earth's umbral shadow and the center of Moon. There are historical reports of cases where a lunar eclipse was in progress at a moonrise prior to sunset. This uncommon arrangement is possible because of atmospheric refraction making both objects appear higher near the horizon than their true geometric positions, and because at the lunar distance the umbra of Earth's shadow has a diameter that is more than 3 times wider than the lunar diameter — greater when Moon is near perigee or Earth is near perihelion, or both. The duration of a lunar eclipse is maximal when the full moon occurs near either of the lunar orbital nodes — in such cases Moon crosses the widest diameter of Earth's shadow.

The moment when Moon is full (lunar opposition) can be astronomically defined as the moment when the calculated ecliptic lunar longitude is 180° away from the calculated ecliptic solar longitude.

Instead of observational or astronomical criteria, however, early Christians decided to use a fixed arithmetic approximation formula, known as the *computus*, based on an excessively long solar year of $365+^1/_4$ days and exactly 235 lunar cycles in 19 solar years, corresponding to a rather excessively long mean lunar cycle of $(365+^1/_4) \times {}^{19}/_{235}$ days = 29 days 12 hours 44 minutes $25+^{25}/_{47}$ seconds.

The Gregorian Reform considerably improved the *computus* by adopting a much more accurate mean lunar month and mean calendar year, based on exactly 70,499,183 lunar cycles in 5,700,000 Gregorian years, corresponding to a mean lunar cycle of $(365+^{97}/_{400}) \times {}^{5700000}/_{70499183}$ days = 29 days 12 hours 44 minutes $2+^{49928114}/_{70499183}$ seconds (or about 2.7082 seconds). [The fraction denominator 70499183 is a full reptend prime number.]

In 1997 the World Council of Churches (WCC) proposed a Uniform Easter as a common date for all churches to observe, reverting back to astronomical determination and originally proposed to take effect in 2001. That proposal, entitled "**Towards a Common Date of Easter**", is on-line at their web site, but its address frequently changes. It is easy to find using a Google search for the keywords "wcc common easter". At the time of writing it was located at:

http://www.oikoumene.org/en/resources/documents/wcc-commissions/faith-and-order-commission/i-unity-the-church-and-its-mission/towards-a-common-date-for-easter/towards-a-common-date-for-easter.html

Quoting key phrases from that document:

> In section I. "The Issues", "Background to this consultation", paragraph 2: "The churches were especially opposed to any calendar reform which would break the cycle of the seven-day week. On the other hand, many churches continued to express interest in the idea of a common day, whether movable or fixed, for the celebration of Easter/Pascha."
>
> In section II, however, the WCC recommendations express a strong preference for astronomical reckoning of Easter, "that Easter should fall on the Sunday following the first vernal full moon … to calculate the astronomical data … by the most accurate possible scientific means …using as the basis for reckoning the meridian of Jerusalem".

For further details, see *Calendrical Calculations, 3rd edition* (abbreviated hereinafter as CC3), by Nachum Dershowitz and Ed Reingold, *Chapter 8: The Ecclesiastical Calendars* (reference 1) and also reference 10 or 11, *Chapter 8: Date of Easter*. Algorithms for implementing the Uniform Easter calculation appear in CC3 section 12.9: *Astronomical Lunisolar Calendars* (reference 1). The WCC recommendations don't specify whether the astronomical moments are to be reckoned according to Jerusalem mean local time or Jerusalem local apparent time — the CC3 authors used local apparent time.

The Gregorian *computus* is appropriate for the Symmetry454 calendar only when the ISO or the smoothly spread nearly symmetrical 71/400 leap rule is employed, because those have the same calendar mean year as the Gregorian calendar. When the preferred 52/293 leap rule is used, however, the Gregorian *computus* is not suitable, due to the shorter calendar mean year of the 293-year cycle. Although I did develop a simple arithmetic *computus* having a mean year matching the 293-year cycle, it does not seem worthwhile to propose using it rather than an algorithm compatible with the WCC's Uniform Easter.

The distribution of Easter dates varies with the span of years evaluated, because of long-term calendar drift (in particular affecting the Julian calendar). A reasonable span to examine is a period of 353 years, which contains almost exactly 4366 lunar cycles, and for the mean northward equinoctial year is more accurate than the classical Metonic period of 19 years with 235 lunar cycles. For the 353 years from 2001 to 2353 on the Gregorian calendar, Gregorian Easter will land on any date from March 22 to April 25, Orthodox Easter can be on any date from April 5 to May 10, and Uniform Easter ranges from March 22 to April 26.

For the Symmetry454 calendar, however, only a few Easter dates are possible (always Sunday, of course). The following are the possible dates for the years 2001 to 2353, showing the highest frequency dates highlighted in **boldface**, and the median and average dates underscored:

> With the **ISO** leap rule the **Gregorian Easter** *computus* yields that following date frequencies:
> Mar 21=12.1%, **Mar 28=23.5%, Apr 7=23.2%, Apr 14=23.3%**, Apr 21=17.6%, Apr 28=0.3%.
>
> With the **52/293** leap rule the **Uniform Easter** date frequencies are:
> Mar 21=14.2%, **Mar 28=23.5%, Apr 7=24.1%, Apr 14=22.1%,** Apr 21=15.3%, Apr 28=0.8%.

The following text appears at the end of the on-line archived document "Constitution on the sacred liturgy *Sacrosanctum Concilium* solemnly promulgated by His Holiness Pope Paul VI on December 4, 1963":

> **Appendix: A Declaration of the Second Ecumenical Council of the Vatican on Revision of the Calendar**
>
> The Second Ecumenical Sacred Council of the Vatican, recognizing the importance of the wishes expressed by many concerning the assignment of the feast of Easter to a fixed Sunday and concerning an unchanging calendar, having carefully considered the effects which could result from the introduction of a new calendar, declares as follows:
>
> 1. The Sacred Council would not object if the feast of Easter were assigned to a particular Sunday of the Gregorian Calendar, provided that those whom it may concern, especially the brethren who are not in communion with the Apostolic See, give their assent.

2. The sacred Council likewise declares that it does not oppose efforts designed to introduce a perpetual calendar into civil society.

But among the various systems which are being suggested to stabilize a perpetual calendar and to introduce it into civil life, the Church has no objection only in the case of those systems which retain and safeguard a seven-day week with Sunday, without the introduction of any days outside the week, so that the succession of weeks may be left intact, unless there is question of the most serious reasons. Concerning these the Apostolic See shall judge.

Source URL: <http://www.vatican.va/archive/hist_councils/ii_vatican_council/documents/vat-ii_const_19631204_sacrosanctum-concilium_en.html>.

Obviously, The Vatican is aware of previous perpetual calendar proposals, in particular the 13-Month calendar and The World Calendar, both of which would have caused Easter to fall on weekdays other than a true Sunday, due to their "null" days. **The Symmetry454 calendar is the answer to this concern. By using the full leap week instead of "null" days the Symmetry454 calendar is perpetual yet conserves the traditional 7-day weekly cycle, ensuring that Easter is always on a genuine Sunday.**

The most common Symmetry454 dates for Gregorian or Uniform Easter, **boldfaced** in the frequency lists above, are the last Sunday in March and the first two Sundays in April. Of those, **Sunday, April 7**th is the Sunday that is closest to the average and the **median date** of Gregorian or Uniform Easter on the Symmetry454 calendar, as underscored in the date frequency lists above, corresponding to either the first or second Sunday of April on the Gregorian calendar.

The date reckoned for Easter also determines the related ecclesiastical days counted before and after Easter. Those before Easter include: Septuagesima Sunday, Sexagesima Sunday, Shrove Sunday, Shrove Monday, Shrove Tuesday / Mardi Gras, Ash Wednesday, Feast of Orthodoxy, Passion Sunday, Palm Sunday, Maundy Thursday (Holy Thursday), Good Friday and Holy Saturday. Those after Easter include: Easter Monday, Rogation Sunday, Ascension Day, Pentecost (Whitsunday), Whitmundy, Trinity Sunday and Corpus Christi.

With the Uniform Easter shifting in parallel to the lunar cycle these ecclesiastical events would not have permanently fixed dates on the Symmetry454 calendar.

With the proposed permanently fixed Easter date of Symmetry454 Sunday April 7th all of these Easter-related days would also have permanently fixed Symmetry454 calendar dates.

The *Kalendis* user can evaluate the Symmetry454 calendar in comparison with other calendars by exporting various Easter Comparison tables for 25 years at a time (web page export) or 100 years at a time (delimited text export), starting from the currently displayed year number. These comparisons also show the relationship to the northward equinox, next full Moon, and the Hebrew Passover.

What is a "Special Day Collision"?
How does the Symmetry454 Calendar avoid it?

On the Gregorian calendar it is possible for two special days to "collide", meaning that they will unfortunately or unintentionally coincide, when one has a fixed day number within the month and the other is observed on a certain weekday of a specified week. For example:

The USA Martin Luther King Jr Day is observed on the 3rd Monday of January. On the Gregorian calendar however, this special day can coincide with the USA Inauguration Day, which occurs every 4 years on January 20th. In fact, this coincidence occurred on the first observance of Martin Luther King Jr Day in 1969. The coincidence is uncommon, occurring every 28 years, except that when the interval spans a non-leap century year it is prolonged to 40 years. On the Symmetry454 calendar the permanent date for Martin Luther King Jr Day is Monday January 15th so it will never coincide with USA Inauguration Day on Saturday, January 20th.

Gregorian calendar coincidence of Martin Luther King Jr Day with Inauguration Day since 1969:

First 400 years:	1997	2025	2053	2081	2121	2149	2177	2217	2245	2273	2313	2341	2369
Years from previous:	→ 28	→ 28	→ 28	→ 28	→ **40**	→ 28	→ 28	→ **40**	→ 28	→ 28	→ **40**	→ 28	→ 28
Second 400 years:	2397	2425	2453	2481	2521	2549	2577	2617	2645	2673	2713	2741	2769

Groundhog Day is observed on February 2nd, which in the USA can collide with Scout Sunday on the first Sunday in February, although this collision would probably not upset anybody! Nevertheless, Scout Sunday is always February 7th on the Symmetry454 calendar, so it will never coincide with Groundhog Day.

The USA Patriot Day, a national day of mourning in remembrance of the terrorist destruction of the World Trade Center in 2001, is observed on September 11th, but Grandparents Day unfortunately collides with it when September 11th is the first Sunday after Labor Day on the Gregorian calendar. On the Symmetry454 calendar the permanent date for Grandparents Day is September 7th, so it will never coincide with Patriot Day.

Reformation Sunday (Protestant), observed on the Sunday that is nearest to October 31, can coincide with Halloween (October 31), All Saints Day (November 1) or All Souls Day (November 2) on the Gregorian calendar. On the Symmetry454 calendar, October 31 does not exist, so Halloween (formerly known as "All Hallows Eve") is permanently on October 28, the eve before All Saints Day ("All Hallows Day"). Since October 28th on the Symmetry454 calendar is a Sunday, it is permanently Reformation Sunday and always coincides with Halloween, although it never coincides with any of the other days mentioned.

In other cases, if both special days are defined as occurring on the same date within the month or on the same weekday of the same week then there is no way to avoid collision. For example, Mothers Day and St. Joan of Arc Day are both on the 2nd Sunday in May, so they will always coincide on Symmetry454 May 14th.

Over time any calendar tends to get more and more congested with holidays and special days, so it becomes progressively harder to avoid coincident events. The Symmetry454 calendar makes it easier to detect when such coincidences occur and easier to plan events to avoid unfortunate collisions. In particular the collision of Easter and related days with other special days on the Gregorian calendar varies from year to year and is essentially impractical to avoid. If the tentatively proposed permanently fixed Easter date of Sunday, April 7th were to be adopted for the Symmetry454 calendar then it would be easy to avoid collision of other special days with Easter and related ecclesiastical days because their observed dates will all be permanently fixed. Existing coincidences include: USA Scout Sunday with Fixed Septuagesima Sunday on February 7th, Valentines Day with Fixed Sexagesima Sunday on February 14th, USA National Doctors Day with Fixed Palm Sunday on March 28, and Mothers Day / Joan of Arc Day with Fixed Rogation Sunday on May 14th.

What about birthdays and events during the Symmetry454 leap week?

The probability of a birth occurring on February 29th of the Gregorian calendar is exactly $^{97}/_{146097}$ or about 0.066%. By contrast, for the preferred 52/293 leap cycle the probability of a birth during the Symmetry454 leap week is exactly $^{1}/_{294}$ or about 0.34% (the probability is almost the same for any of the alternate leap rules). Thus there is still only a low probability of a birth occurring on any day of a leap week. This should not be surprising, since the leap week is appended only once per 6 or 5 years.

Lunisolar calendars have been and continue to be very widely used, such as the Babylonian, Chinese, Korean, Vietnamese, traditional Japanese, and Hebrew calendars. They insert a whole leap month every 3 or 2 years. Using the 19-year metonic cycle as an example, the probability of a birth during a leap month is $^{7}/_{235}$ = almost 3%, which is almost 9 times more likely than a birth during a Symmetry454 leap week or almost 45 times more likely than a Gregorian February 29th birth, yet that is culturally accepted and nobody cares about it. All that is required is a rule for observing such an event in non-leap years.

The overriding principle is that birthdays, anniversaries, memorial days, and other annual events must be observed once and only once per calendar year.

Events that initially occurred during the Symmetry454 leap week, such as a birthday or wedding shall, during years without a leap week, be observed on the corresponding weekday of the last week of the year. For example, a baby born during the leap week in 2004 on Thursday, the 32nd of December would have its birthday on Thursday, the 25th of December during years without a leap week.

Events that regularly occur early in the year but are counted relative to a date in December shall, during years following a leap week, be observed on a fixed date early in the year, not counting the days of the leap week.

For example, subject to the approval of the Churches, if this policy is accepted then the Christian Epiphany, traditionally observed 12 days after Christmas (outside the USA) would always be observed on Tuesday, January 9th on the Symmetry454 calendar (which has Christmas 3 days before New Year Day), regardless of whether the prior year has a leap week. If the leap week were included in the 12-day count then Epiphany would shift back by one week to Tuesday, January 2nd on the Symmetry454 calendar, which would make the year after a leap year exceptional. Churches in the USA observe Epiphany on the first Sunday after New Year Day, which is always January 7th — perhaps the convenience of this fixed observation would be attractive to Churches outside the USA as well.

Candlemas is the last Christian special day that is observed relative to Christmas (Nativity), counted 40 days after Christmas, which is February 2nd on the Gregorian calendar. Following a non-leap year, the date that is 40 days after the Symmetry454 Christmas is Tuesday, February 9th. If the leap week were included in the count then following a leap year Candlemas would shift back by one week to Tuesday, February 2nd.

Multi-day events that on the Gregorian calendar begin near the end of December and continue beyond the last day of the month shall in Symmetry454 leap years continue into the leap week. For example the 7-day Afro-American festival of Kwanzaa starts December 26. As it would be unacceptable to insert a 7-day gap into this festival during leap years, Kwanzaa shall continue into the leap week instead of skipping to January. Alternatively, the Afro-American community might decide to extend Kwanzaa by an extra week through the leap week — why not? If that alternative is adopted then Kwanzaa will always span from Friday, December 26 to Thursday, January 4th on the Symmetry454 calendar, otherwise it will end on Thursday, December 32nd in leap years. Actually in non-leap years Kwanzaa will be problematic: the original intention, when this festival was started in 1966, was to observe it from Gregorian December 26th through January 1st, which does not cut into the regular working days in January. On the Symmetry454 calendar, because December is usually a short month, there are not enough days to observe Kwanzaa as originally intended, except in leap years.

Of course New Year Eve will always be on the last Symmetry454 day of the year, which is December 28th in regular years or, in leap years, December 35th.

My birthday was on Gregorian January 31st, 1962 — what should I do?

On the Symmetry454 calendar January, March, April, June, July, September, October, and December (in non-leap years) are short 28-day months. For any Gregorian birthday that is on the 29th, 30th or 31st of any of these months the recommended handling is to use a computer program such as my *Kalendis* program to convert the original date of birth to the corresponding date on the Symmetry454 calendar. For example Gregorian January 31st, 1962 corresponded to Wednesday, February 3rd on the Symmetry454 calendar.

As another example, George Washington, first President of the USA, was born on Julian February 11, 1732. When the USA switched to the Gregorian calendar observance of Washington's birthday was changed to the corresponding Gregorian date, February 22. The equivalent Symmetry454 date was Friday, February 26th.

If the birthday in question was on a calendar that is not supported by my *Kalendis* program, then first use the *Calendrica* applet at <http://www.calendarists.com/> to convert the date to a calendar that *Kalendis* supports.

Will my Symmetry454 birthday vary more with respect to my "solar birthday"?

If you want to celebrate a birthday or event every time Earth returns to the same position in its orbit, on the "solar birthday" or "solar anniversary", my question is: the calendar that you are using doesn't do that, so why do you expect that of the Symmetry454 calendar? If you think that your birthday on Gregorian calendar corresponds to your solar birthday, I've got news for you: it doesn't! The spring equinox has a "wobble range" of 2.2 days on the Gregorian calendar!

Variations between the Gregorian calendar, equinoxes, solstices and "solar birthdays" or "solar anniversaries" are due to the following factors, and others:

- The largest variations are due to the Gregorian leap year rules, ranging from –1 to +1.3 days, depending on when the original birthday was in the 400-year Gregorian cycle of years.
- The mean solar year is not divisible by the mean solar day.
- The length of the mean solar year is slowly getting shorter.
- The length of the mean solar day is slowly getting longer.
- Changing your position on Earth's surface (*eg*., moving to a home in another city).
- Earth moves fastest in its orbit when it is closest to Sun (perihelion) and slowest when it is furthest from Sun (aphelion), but these time points slowly vary — see reference 3.

Calendars that resynchronize annually with an equinox or solstice have slightly less variation between calendar and solar birthdays or anniversaries, but are not perpetual calendars — the starting day-of-week changes from year-to-year and new calendars have to be printed each year including the equinox or solstice adjustment.

My *Kalendis* program does compute the solar longitude, so if you want to know when to observe a solar birthday or event, by all means use *Kalendis* to go back in time, note the solar longitude on the desired starting date (displayed near the bottom right of its "Control Panel" window), and then you can use that solar longitude to find the solar birthday or anniversary in later years. From the "Options" menu choose "Year Steps by…" and make sure that it is set to "Solar Year (same solar longitude)", which is the default. Then choose "Solar Years" from the "Step" menu and use the up- or down-arrow key to move forward or backward one year at a time — rather than stepping in calendar year increments, *Kalendis* steps by an amount that keeps a constant solar longitude and so you can see the solar birthday or anniversary in all of the displayed calendar windows! Alternatively you can use the *Calendrica* applet at <http://www.calendarists.com/>, which displays it as "Solar position", and then use *Calendrica* to compute solar birthdays or anniversaries on almost any calendar in the world. The displayed solar longitude is for 00:00h Universal Time on that date at the Prime Meridian.

Birthdays and events on lunar-solar calendars, such as the Chinese, Korean, Vietnamese, traditional Japanese, and Hebrew calendars, vary with respect to the solar birthday by up to about a half-lunar cycle, depending on the position of the original birthday or event with respect to the possible insertion of a leap month, yet this large variation is culturally accepted. Birthdays and events on strictly lunar calendars, such as the Islamic calendar, progressively march through the seasons, so such birthdays can fall at almost any solar longitude.

It is true that at present, in comparison to the Gregorian calendar the Symmetry454 calendar introduces slightly more calendar *vs.* solar birthday variability, but isn't this a small price to pay for its many benefits?

In the future, the Gregorian calendar will drift quite far off the solar cycle — see the heading "**How accurate is the Symmetry454 Calendar? How does it vary with seasons?**" in the document *Frequently Asked Questions (FAQs) about the Symmetry454 Calendar*. Also please see my web dedicated to the seasons: "**The Lengths of the Seasons**" at <http://www.sym454.org/seasons/>. The long-term drift of the Symmetry454 calendar with 52/293 leap rule will be unequivocally superior to the Gregorian calendar.

What about observation of holidays and events?

As explained above, all holidays and events, with the exception of Easter and related days counted before and after Easter, have permanently fixed dates within the month and fixed day of week. However converting from Gregorian to the appropriate Symmetry454 date requires some guidelines:

- Events that are assigned to a specific date within a month but are not tied to a specific historical event, such as Christmas Day (Dec 25), Valentines Day (Feb 14), *etc.* should simply be observed on the numerically matching date within the same Symmetry454 month (Mon Dec 25 and Mon Feb 14, respectively, on the Symmetry454 calendar, for the examples given).
- Events that are assigned to a specific weekday within a month, such as the 2nd Monday in October (Columbus Day in the USA and Thanksgiving in Canada), would continue to be observed according to the same rule on the Symmetry454 calendar, but in all such cases the observance will always fall on the same day number within the month (October 8th for the examples given).
- Historical events that have been specifically designated by an organization or government to be observed on a certain date within a month, or a certain day of a certain week within a month should usually be observed on the corresponding date within that month or the specified day of the specified week within the month, as this policy will generally be the most socially acceptable and cause the least confusion.
- However if the original date does not exist on the Symmetry454 calendar (29th, 30th or 31st of January, March, April, June, July, September, October, or, in non-leap years, December) then usually it will be least confusing to observe the event on the last day of the traditional month. These situations are uncommon, for example, the cases that apply to North America are:
  - USA National Doctors Day on Gregorian March 30th would be observed on Symmetry454 Sunday March 28th.
  - Canada Tax Day is traditionally Gregorian April 30th, postponed to May 1st when it is a Sunday — on Symmetry454 the last day of April is Sunday the 28th so Canada Tax Day would always be on Monday, May 1st.
  - Halloween, on Gregorian October 31st becomes Sunday October 28th on the Symmetry454 calendar.
- Events that commemorate a specific historical event can be switched to the Symmetry454 calendar date that corresponded to that historical event, using a calendar calculator such as my *Kalendis* program and the ISO standard leap rule, provided that it is socially acceptable to make this change. It so happened that the attack on Pearl Harbor on Gregorian Sunday, December 7th, 1941 corresponded to Symmetry454 Sunday December 7th, so no change in observance is necessary. The atomic bombing of Hiroshima on Gregorian Monday, August 6th, 1945 was August 8th on the Symmetry454 calendar. Since August 6th is always Saturday on the Symmetry454 calendar, the public may prefer to commemorate this event on the Monday.

The end of World War I at the 11th hour on the 11th day of the 11th month in 1918 corresponded to Monday, November 15th on the Symmetry454 calendar. The number 11 was special for this event, so it would probably not be socially acceptable to observe Veterans Day / Remembrance Day on the 15th of November. On the other hand, for government employees, observance on Monday the 15th would make a long weekend, whereas the 11th of November is always Thursday on the Symmetry454 calendar.

The Symmetry454 dates were sometimes the same as the original Gregorian dates, for example on the occasions of the USA Declaration of Independence on Thursday, July 4th, 1776 (Symmetry454 July always matches when a Gregorian leap year starts on Monday) and the original Canadian Dominion Day on July 1st 1867 (Symmetry454 July also matches when a Gregorian non-leap year starts on Tuesday).

Kalendis displays holidays and events

The freeware *Kalendis* computer program, a calendrical calculator for Windows, is freely available for download from the Symmetry454 calendar home page at <http://www.sym454.org/kalendis/>. It computes the dates of numerous common holidays and events according to the rules outlined above.