The Shortest day... and more

Sunrise, sunset
Sunrise, sunset
Swiftly flow the days
Seedlings turn overnight to sunflowers
Blossoming even as we gaze

Sunrise, sunset
Sunrise, sunset
Swiftly fly the years
One season following another
Laden with happiness and tears

from the musical Fiddler on the Roof - but you knew that
- written by Jerry Bock (music) and Sheldon Harnick (lyrics).

The calendar program I use - Chazon Shamayim - shows the length of a halachic hour, based on the time between sunrise and sunset.

December 20, 21, and 22 show 50 minutes and 21 seconds - for Jerusalem.
That calculates to the length of the day being 10 hours and 4.2 minutes.

Short days mean late sunrises and early sunsets.
But the latest sunrise and the earliest sunset don't happen on the same day.

Earliest sunset in Jerusalem was on December 3rd at 4:30:03pm.
On that day, the sun had risen at 6:22:54am. The length of the day was 10 hours and 11.8 minutes. That's 7.6 minutes longer than the shortest day.

Latest sunrise will be on January 9th, when the sun will rise at 6:40:04am.
On that day, the sun will set at 4:57:43pm. The length of the day will be 10 hours and 12.4 minutes. That's 8.2 minutes longer than the shortest day.

Seven-eight minutes difference - doesn't sound like much, but it is interesting that late sunrise and early sunset don't match up.

Ask Chat-GPT and then ask for a simplified explanation, and here's what you get:

Why the Earliest Sunset and Latest Sunrise Don't Happen on the Same Day

The earliest sunset happens before the shortest day of the year, and the latest sunrise happens after, because the Sun and our clocks aren't perfectly in sync.

The Earth is tilted, and it moves in an orbit that isn't a perfect circle. Because of this, the Sun appears to speed up and slow down slightly over the course of the year. That uneven motion makes sunset reach its earliest point first, while sunrise keeps getting later for a couple of weeks more.

So even though the winter solstice is the day with the least daylight, the earliest sunset comes a bit earlier and the latest sunrise a bit later.

Chat-GPT (or Geppetto, as I call him) offered an analogy to explain the issue. I found it more confusing that his original answer, but maybe you will prefer it.

Analogy: Two Clocks That Don't Tick at the Same Speed

Imagine you have two clocks:

Clock A – your regular, even-ticking clock (this represents our civil time).

Clock B – a clock that runs a tiny bit fast some weeks and a tiny bit slow other weeks, even though on average it keeps the right time (this represents the Sun's apparent motion).

Now imagine you're measuring sunrise and sunset using Clock B, but you record the results using Clock A.

Because Clock B doesn't tick evenly:

Sunset reaches its earliest point when Clock B is drifting one way,
Sunrise reaches its latest point when Clock B is drifting the other way,
even though the actual shortest day (the solstice) is in the middle.

The mismatched clocks make the earliest sunset "happen early" and the latest sunrise "happen late" – even though the solstice sits right between them.

That's about it. Just wanted to share this with you.