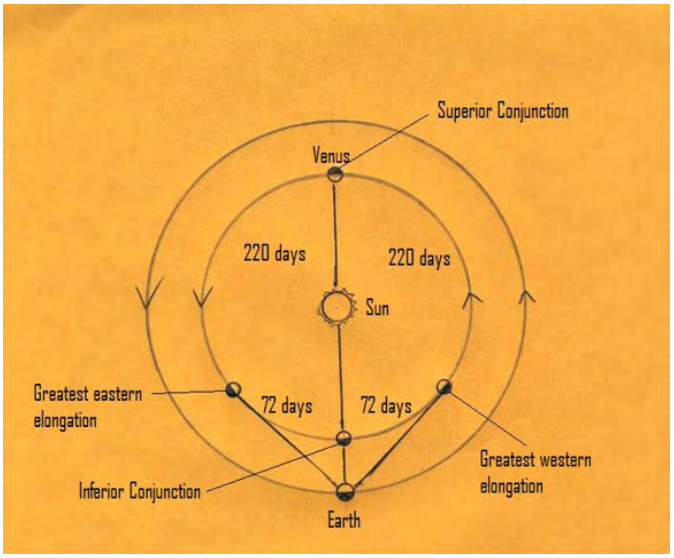
Why the planet Venus is brightest in February

The dazzling planet Venus reaches its greatest illuminated extent as the evening "star" in February 2017. **It means Venus' day side, or illuminated side, is covering more square area of Earth's sky than at any other time during this current evening apparition of Venus**. And that means that Venus is brighter around now than at any other time during its approximate 9.6-month reign in the evening sky. **Surprisingly, as Venus continues to wane to a crescent the planet grows in apparent size**. Venus is actually at its brightest on February 18, about one and one-third days after reaching its greatest illuminated extent.

Venus and Mars in the western evening sky. The insert shows what Venus at the moment looks like, if magnified 100 times

Why is Venus so bright now? You might think Venus appears most brilliant when we see its disk as most fully illuminated from Earth. Not so. If you were to observe Venus with the telescope at its greatest illuminated extent, you'd see that Venus' disk is only a touch more than one-quarter illuminated by sunshine. When we see a full Venus is always on the far side of the sun from us, so its disk size at full-phase is always small. **It's only when we see Venus as a crescent that this world comes close enough to us to exhibit its greatest illuminated extent, at which time its daytime side covers the greatest area of sky.**

Earth and Venus orbit the sun counterclockwise as seen from earthly north. Venus reaches its greatest eastern elongation in the evening sky about 72 days before inferior conjunction and its greatest western elongation in the morning sky about 72 days after inferior conjunction. **Greatest illuminated extent for Venus comes midway between a greatest elongation and an inferior conjunction**.

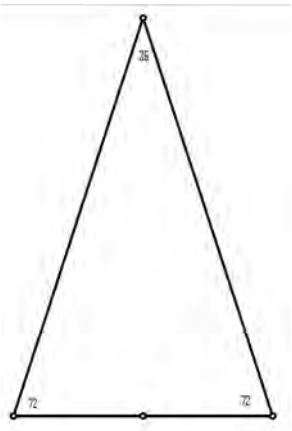


Orbits of Venus and the Earth around the Sun, showing Superior and Inferior conjunctions with Greatest Elongations

Venus last transitioned from the morning to evening sky when it swung directly behind the sun from Earth (superior conjunction) on June 6, 2016. Venus reached its greatest eastern (evening) elongation from the sun on January 12, 2017. It will swing between the Earth and sun (inferior conjunction) on March 25 and thereby enter the morning sky. It will reach its greatest western (morning) elongation from the sun on June 3, 2017.

Venus won't pass precisely between us and the sun on March 25. If it did, Venus would transit the sun, as it did in June of 2012. This time, Venus will swing 8° (degrees) north of the sun. That means sky gazers can have a good shot at viewing Venus in both the evening and morning sky for several days around inferior conjunction!

Venus exhibits its greatest illuminated extent about 36 days before – and after – inferior conjunction. Through the telescope, Venus appears about 25% illuminated in sunshine at these times. Let the golden triangle help you to remember these Venus milestones. The two base angles equal 72º and the apex angle equals 36°. Quite by coincidence, Venus' greatest elongations happen 72 days before and after inferior conjunction, and Venus' greatest illuminated extent happens 36 days before and after inferior conjunction. (See above diagram of Venus' and Earth's orbits.)



The Golden Triangle, with the apex angle = 36° and the two base angles = 72°

Even though this world is only about one-quarter illuminated in sunshine right now, as seen from Earth, Venus is nonetheless shining at its brightest best in the evening sky! Plus, Mars is nearby. **Both can be found in the west after sunset.**

AK, with EarthSky Notes