Problem of the Week

Problem C

Cycles of Eclipses

A planet in a distant solar system has a moon and a sun. On this planet, there is a total solar eclipse whenever the following is true.

- There is a full moon,
- the moon is at its closest point to the planet, and
- the centre of the moon is in line with the centres of the planet and the sun.

On this planet, there is a full moon every 16 days. Also, every 12 days, the moon is at its closest point to the planet. As well, every n days the centre of the moon is in line with the centres of the planet and the sun.

If n is greater than 10 but less than 20, and total solar eclipses happen on this planet every 240 days, determine the value of n.