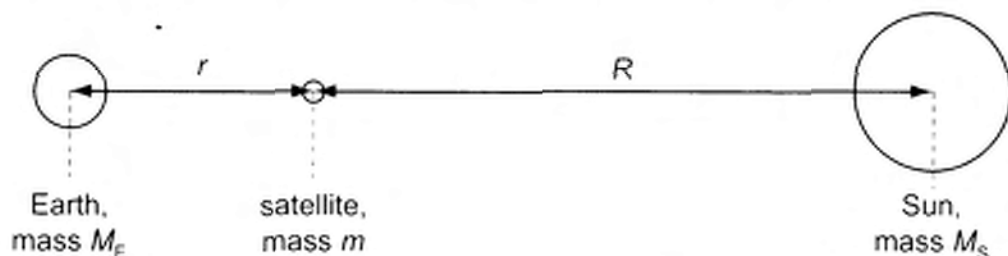16 The diagram shows a solar satellite, mass m, positioned directly between the Earth, mass M_E, and the Sun, mass M_S. The satellite is a distance r from the Earth and a distance R from the Sun.

The satellite rotates in a circle around the Sun once a year and therefore moves around the Sun with the Earth, both having the same angular velocity ω.

Which *force = mass × acceleration* equation applies for the satellite?

A $\quad \dfrac{GM_S m}{R^2} = m \times (R\omega^2)$

B $\quad \dfrac{GM_E m}{R^2} = m \times (r\omega^2)$

C $\quad \left(\dfrac{GM_E m}{r^2} - \dfrac{GM_S m}{R^2}\right) = m \times (R\omega^2)$

D $\quad \left(\dfrac{GM_S m}{R^2} - \dfrac{GM_E m}{r^2}\right) = m \times (R\omega^2)$

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