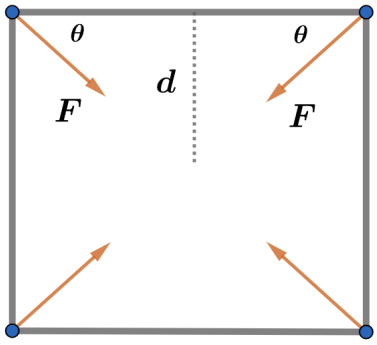
2020A F=ma Exam: Problem 4

Kevin S. Huang



Using rotational symmetry and the fact that there is no tangential acceleration, the forces at the joints have the same magnitude and point towards the center. From circular motion applied to the top rod,

$$2F\sin\theta = m\omega^2 d$$

Since $\theta = \pi/4$,

$$2F\frac{\sqrt{2}}{2} = m\omega^2 d$$

$$F = \frac{m\omega^2 d}{\sqrt{2}}$$

so the answer is $\boxed{\text{B}}$.