8 Many galaxies have a supermassive black hole at its core. Studies of stars that orbit close to the centre of our Milky Way galaxy's central black hole, Sagittarius A* can yield the approximate mass of the black hole. One star, S4714, is as of 2020, the record holder of closest approach. Given that it orbits with a period of 12 years and at a radius of 1.3×10^{14} m, what is the approximate mass of Sagittarius A*?

A 5.0×10^{8} kg **B** 9.1×10^{36} kg **C** 2.7×10^{45} kg **D** 8.3×10^{51} kg