104. (a) The gravitational force exerted on the baby (denoted with subscript *b*) by the obstetrician (denoted with subscript *o*) is given by

$$F_{bo} = \sqrt{\frac{Gm_o m_b}{r_{bo}^2}} = \sqrt{\frac{\left(6.67\times10^{-11}\,\text{N}\cdot\text{m}^2/\text{kg}^2\right)\left(70\text{kg}\right)\left(3\text{kg}\right)}{\left(1\text{m}\right)^2}} = 1\times10^{-8}\,\text{N}.$$

(b) The maximum (minimum) forces exerted by Jupiter on the baby occur when it is separated from the Earth by the shortest (longest) distance r_{min} (r_{max}), respectively. Thus

$$F_{bJ}^{\text{max}} = \sqrt{\frac{Gm_J m_b}{r_{\text{min}}^2}} = \sqrt{\frac{\left(6.67\times10^{-11}\,\text{N}\cdot\text{m}^2/\text{kg}^2\right)\left(2\times10^{27}\,\text{kg}\right)\left(3\text{kg}\right)}{\left(6\times10^{11}\,\text{m}\right)^2}} = 1\times10^{-6}\,\text{N}.$$

(c) And we obtain

$$F_{bJ}^{\text{min}} = \sqrt{\frac{Gm_J m_b}{r_{\text{max}}^2}} = \sqrt{\frac{\left(6.67\times10^{-11}\,\text{N}\cdot\text{m}^2/\text{kg}^2\right)\left(2\times10^{27}\,\text{kg}\right)\left(3\text{kg}\right)}{\left(9\times10^{11}\,\text{m}\right)^2}} = 5\times10^{-7}\,\text{N}.$$

(d) No. The gravitational force exerted by Jupiter on the baby is greater than that by the obstetrician by a factor of up to 1×10^{-6} N/1×10^{-8} N = 100.