12. We use $W_p = mg_p$, where W_p is the weight of an object of mass m on the surface of a certain planet p, and g_p is the acceleration of gravity on that planet.

    (a) The weight of the space ranger on Earth is $W_e = mg_e$ which we compute to be $(75\,\text{kg})\left(9.8\,\text{m/s}^2\right) = 7.4 \times 10^2\,\text{N}$.

    (b) The weight of the space ranger on Mars is $W_m = mg_m$ which we compute to be $(75\,\text{kg})(3.8\,\text{m/s}^2) = 2.9 \times 10^2\,\text{N}$.

    (c) The weight of the space ranger in interplanetary space is zero, where the effects of gravity are negligible.

    (d) The mass of the space ranger remains the same (75 kg) at all the locations.