

48. (a) The thrust is Rv_{rel} where $v_{\text{rel}} = 1200$ m/s. For this to equal the weight Mg where $M = 6100$ kg, we must have $R = (6100)(9.8)/1200 \approx 50$ kg/s.
- (b) Using Eq. 9-42 with the additional effect due to gravity, we have

$$Rv_{\text{rel}} - Mg = Ma$$

so that requiring $a = 21$ m/s² leads to $R = (6100)(9.8 + 21)/1200 = 1.6 \times 10^2$ kg/s.