Exam I

Multiple Choice: 1. (a), (c) and (d)  
                2. (a)-(ii), (b)-(i) and (c)-(ii)

Short answers: 1. $\Delta l_{\text{Mars}} = 0.76h$  
                2. No. The weight of the boxer decreases since $W = mg$ and $g$ is 1/6th that of Earth. But, his mass and inertia stays the same; changing his direction of motion requires just as large a force and so is just as difficult (more so, in fact, since you're $\hat{n}$ is smaller and hence friction to grip the ground with is smaller).

Problem 1: (a) $\ddot{a} = 2.7 \text{ m/s}^2 \hat{y}$  
           (b) $y = 27.0 \text{ km}$  
           (c) $v = 0$ and $a = -9.8 \text{ m/s}^2$

Problem 2: (a) $v_0 = 19.9 \text{ m/s}$  
           (b) $t = 2.0 \text{ s}$

Problem 3: (a) $\mu_{\text{max}} = 0.25$  
           (b) $v = 3.4 \text{ m/s}$

Problem 4: (a) $\theta = -80^\circ$  
           (b) $\vec{v}_{P/I} = 19.7 \text{ m/s}$ in direction $88.5^\circ$ above $\hat{x}$