hhh.3.47_3.51

3.47 Simply use Newton's second law. F = ma, Find the force using the original mass and acceleration and then apply that to the 1 kg mass.

3.48 Remember that weight is the force of gravity and is equal to mass times "g." "g" is the specific acceleration due to gravity at the surface of earth (or any other planet or large celestial body). Thus "g" changes for different planets and the moon. It is actually a little weaker on earth at the poles than it is at the equator.

The universal gravitational constant is given the letter **G**. Upper case G and applies to any bodies with mass.

The gravitational force between two bodies is equal to

$$F_{gravity} = G\frac{m_1 m_2}{r^2}$$

Notice that this law obeys the same "inverse square law" that electrical force between two charges exhibit.

"G" is equal to 6.67×10^{-11} N•m^2•kg^{-2}

3.49 The tension is just the force on the cart. So Newton;s law just takes the form *Tension=ma*

$a = v \cdot t$

also

$v_{final}^2 = v_o^2 + 2ad$

3.50 Using $v_{final}^2 = v_{initial}^2 + 2ad$

$v_{final}^2 = v_{initial}^2 + 2\frac{Force}{mass}d$

the initial velocity is 20 m/s and the final velocity is 0, thus the acceleration is negative.

3.51 Once again use

$$v_{final}^2 = v_{initial}^2 + 2ad$$

Please memorize this equation. It will save you a lot of trouble in this class. It allows you to do many motion calculations without first solving for time.