

Chapter 6

Force of kinetic friction	$f_k = \mu_k * N$ <p>Where μ_k is the coefficient of kinetic (i.e., sliding) friction. f_k is directed so as to oppose the velocity.</p>
Maximum force of static friction on an object	$f_s = \mu_s * N$ <p>Where μ_s is the coefficient of static friction. f_s is directed as required in order to make the sum of the forces on the object equal to zero.</p>
If a light inextensible string connects two objects ...	<p>The accelerations of the two objects are equal and the string pulls with equal forces on each of the objects.</p>

<p>Force exerted by a stretched spring (Hooke's Law)</p>	$F_x = -k \cdot x$ <p>Where k is a constant depending on how strong the spring is and where x is the displacement through which the spring has been stretched. If $x > 0$ then the force F_x is in the negative x direction.</p>
<p>Acceleration of an object moving around a circle of radius r with a constant speed v.</p>	$\text{acceleration} = a_c = v^2/r$ <p>The acceleration a_c is directed inwards, toward the center of the circle.</p>
<p>Free body diagram of an object on an inclined plane</p>	<p>\mathbf{N} is shorter than \mathbf{W} ($N = W \cos(\Theta)$) and $\mathbf{W} + \mathbf{N}$ is down the plane)</p>

Free body diagram of a car rounding a banked corner	\mathbf{N} is longer than \mathbf{W} ($W=N\cos(\Theta)$) and $\mathbf{W} + \mathbf{N}$ points inward)
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Chapter 7

Work	$F \cdot \cos(\Theta) \cdot d$, F is the size of the force \mathbf{F} acting through a distance d . Θ is the angle between \mathbf{F} and the \mathbf{d} , the vector Displacement.
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Positive work	Work is positive when Θ lies between -90 and 90 degrees (work is negative when Θ lies between 90 and 270 deg)
Kinetic energy (KE)	$0.5 \text{ mass} * \text{velocity}^2$ $0.5 m * v^2$
relation between work done and the increase on the kinetic energy of an object	work done on an object = object's increase in KE (if the work done is negative, the object's KE decreases)

Power

(time) rate at which work is done:
 $P = W/t (= F \cdot v$, where F is the
external force on an object and
where v is the object's velocity