

Name Key Period \_\_\_\_\_ Date \_\_\_\_\_  
Review for ch 4 + 5 Test

1. Newton's First Law of motion is also called inertia. Define this Law here:  
an object at rest . . . . .

2. MASS is a measure of an object's inertia and is measured in GRAMS.

3. The Force that gravity has on mass is called Weight

4. acceleration due to gravity uses the symbol g and has a value of  $-10 \frac{m}{s^2}$

5. what is the weight of the following masses?

a.  $3 \text{ kg} = \underline{30 \text{ N}}$

b.  $110 \text{ kg} = \underline{1100 \text{ N}}$

c.  $1500 \text{ g} = \underline{15 \text{ N}}$   
 $1.5 \text{ kg}$

6. what is the mass of the following weights?  
 $w = mg$        $m = \frac{w}{g}$

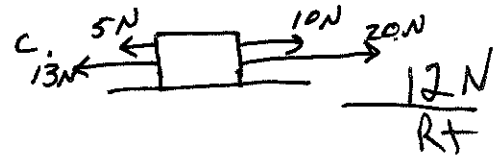
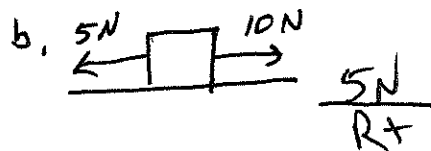
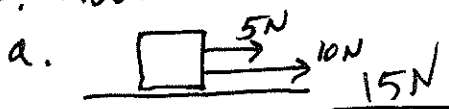
a.  $100 \text{ N} = \underline{10 \text{ kg}}$

b.  $630 \text{ N} = \underline{63 \text{ kg}}$

c.  $2400 \text{ N} = \underline{240 \text{ kg}}$

7. when adding all of the forces on an object, you get one equivalent force called the Net Force.

8. Add the forces to find this equivalent force:



9. what happens to the motion of an object moving at  $3 \frac{m}{s}$  when the net force = 0? Nothing

this is also called constant velocity, Equilibrium

10. If the 1st law of motion states that no force is required to maintain motion, why do you have to keep peddling to keep your ~~brated~~ bicycle in constant motion?  
to overcome friction + wind resistance

11. Newton's 2nd law of motion states:  
 acc is caused by unbalanced forces, aka net force.  
 acc related to force and mass  $F=ma$   $a = \frac{F}{M}$

12. what causes objects to accelerate?  
 unbalanced forces or net force  $\neq 0$

13. Newton's 2nd law has an equation, what is it?  
 $F=MA$

14. if the mass of 8kg needs to be accelerated at  $\frac{4m}{s^2}$ , what force is required to do this? \_\_\_\_\_  
 $1N = 1kg \left( \frac{m}{s^2} \right)$

$$F=MA = 8kg \left( \frac{4m}{s^2} \right) = \boxed{32N}$$

15. A 15N Force is applied to a ~~2.5~~ 2.5 kg mass,  
 what is its acceleration? \_\_\_\_\_

$$a = \frac{F}{M} = \frac{15N}{2.5kg} = \boxed{6 \frac{m}{s^2}}$$



16. Define Friction  
 The force that opposes the intended motion and is affected by

17. what are the factors that affect friction?
- Pressure between the surfaces
  - Texture
  - Materials that make up the surfaces

18. what does the term coefficient of friction mean?  
 it is the factor that the pressure is multiplied by to tell you how much friction there is

19. compare static friction with kinetic friction

static	kinetic
- no motion	- moving or sliding
- "interlocking" "bumps" makes this more than when moving	- less than static
	- not fully interlocked

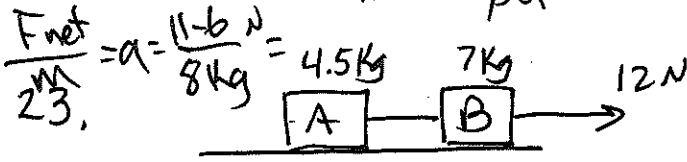
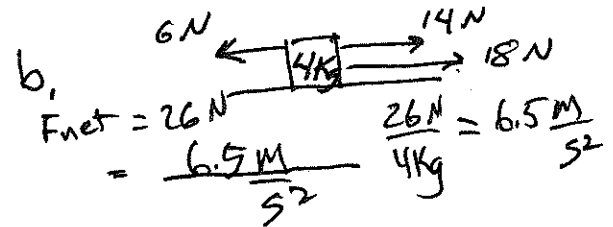
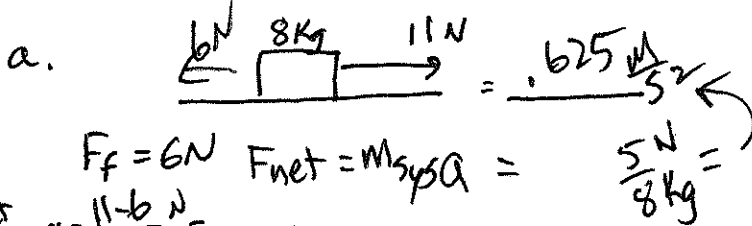
$$F_f = \mu Mg$$

20. What is the range of values for the coefficient of friction?  
 $0 \rightarrow .9999 \dots < 1$

21. What is the amount of static friction for a 6 kg block, where  $\mu_s = .23$ ?

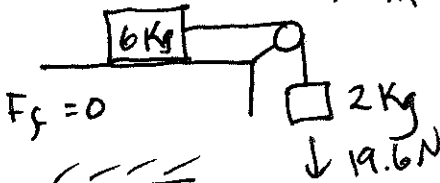
$$F = \mu Mg = .23(6\text{kg})(10\frac{\text{m}}{\text{s}^2}) = \boxed{13.8\text{ N}}$$

22. Find the acceleration for these:



what is the acceleration of Box A?  $.61 \frac{\text{m}}{\text{s}^2}$  Rt

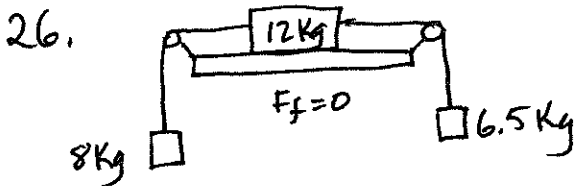
24.  $F_{\text{net}} = 12\text{ N} - 2\text{ N} - 3\text{ N} = 7\text{ N}$   
 $F_f = 2\text{ N}$   
 $F_f = 3\text{ N}$   
 $a = \frac{F}{M} = \frac{7\text{ N}}{11.5\text{ kg}} = .61 \frac{\text{m}}{\text{s}^2}$



what is the acceleration of the top box?  $2.45 \frac{\text{m}}{\text{s}^2}$



what is the acceleration of box on the right?  $1.2\text{ kg}(9.8) = 11.76\text{ N}$   
 $\frac{11.76\text{ N}}{15.6\text{ kg}} = \boxed{.75 \frac{\text{m}}{\text{s}^2}}$



what is the acc of the box hanging on the right?  $1.5(9.8) = 14.7\text{ N}$   
 $\frac{14.7\text{ N}}{12+8+6.5} = \boxed{.55 \frac{\text{m}}{\text{s}^2}}$

27. What is Free fall?

Falling to Earth without upward support

28. What is terminal velocity?

the speed, while falling, where  $w = \text{air resistance}$

29. Give examples of objects that have different terminal velocities, and which is higher.  
 Rock, cotton ball  
 Rock is higher