

CP - Jan 24 Review.

- Newton's first law of motion is also called Inertia. Define this law here: object at rest tends to stay at rest. object in motion tends to stay in motion, in a straight line, unless
- MASS is a measure of an object's inertia and is measured in grams.
- The force that gravity has on mass is called weight.
- acceleration due to gravity uses the symbol g and has a value of -9.8 m/s².
acted on by an outside net force.

5. What is the weight of the following masses?

a. 3kg = 29.6N b. 110kg = 1078N c. 15kg = 147N

$w = mg$ $3kg (9.8m/s^2)$ $110kg$ $15kg$

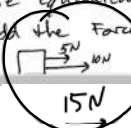
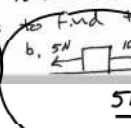
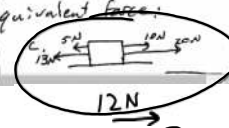
b. What is the mass of the following weights?

a. 100N = 10.2kg b. 630N = 64.3kg c. 2400N = 244.9kg

$w = mg$ $m = \frac{w}{g}$

7. When adding all of the forces on an object, you get one equivalent force called the Resultant.

8. Add the forces to find this equivalent force:

a.  b.  c. 

if mass of C = 8kg what is acc?

$F = ma$
 $\frac{F}{m} = a = \frac{12N}{8kg} = \boxed{1.5 \frac{m}{s^2}}$

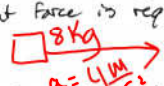
9. What happens to the motion of an object moving at $3 \frac{m}{s}$ when the net force = 0?
NO change in motion
 this is also called inertia

10. If the 1st law of motion states that no force is required to maintain motion, why do you have to keep pedaling to keep your ~~torpedo~~ bicycle in constant motion?

11. Newton's 2nd law of motion states:
 $F = ma$

12. What causes objects to accelerate?
unbalanced force or net force

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

14. if the mass of 8kg needs to be accelerated at $4 \frac{m}{s^2}$, what force is required to do this?
 $a = 4 \frac{m}{s^2}$ $F = ma = (8)(4) = \boxed{32N}$

15. A 15N force is applied to a ~~2kg~~ 2.5 kg mass, what is its acceleration?
 $F = ma$ $a = \frac{F}{m} = \frac{15N}{2.5kg} = \boxed{6 \frac{m}{s^2}}$

17. What are the factors that affect friction?

- Pressure between surfaces
- Types of material (rubber, wood, concrete)
- Texture

18. What does the term coefficient of friction mean?

a multiplier times pressure that will tell how much friction

19. Compare static friction with kinetic friction

$\mu = \text{from } 0 \text{ to } < 1 \text{ over } 1 \text{ and damage occurs}$

20. What is the range of values for the coefficient of friction? $0 - 1$

21. What is the amount of static friction for a 6kg block, where $\mu_s = .23$? 13.52 N

$F_f = \mu mg = .23(6\text{kg})(9.8 \frac{\text{m}}{\text{s}^2})$

22. Find the acceleration for these:

a. 6N 8kg 11N

$F_f = 6\text{N}$

$F_{\text{net}} = ma$

$5\text{N} = 8\text{kg} a$

$\frac{5}{8} = a = .63 \frac{\text{m}}{\text{s}^2}$

b. 6N 14N 18N

$18 + 14 - 6 = 26\text{N} = 4\text{kg} a$

$\frac{26\text{N}}{4\text{kg}} = a = 6.5 \frac{\text{m}}{\text{s}^2}$

23. 4.5kg 7kg 12N

$F_f = 2\text{N}$ $F_f = 3\text{N}$

what is the acceleration of box A?

$7\text{N} = (11.5\text{kg}) a = .61 \frac{\text{m}}{\text{s}^2}$

24. 6kg 2kg

$F_f = 0$ 19.6N

what is the acceleration of the top box?

$19.6\text{N} = (6+2) a = \frac{19.6}{8} = a = 2.45 \frac{\text{m}}{\text{s}^2}$

25. 7.2kg 8.4kg

$F_f = 0$

what is the acceleration of box on the right?

$F_{\text{net}} = m_{\text{sys}} a$

$11.76\text{N} = (15.6) a$

$\frac{11.76\text{N}}{15.6\text{kg}} = a = .75 \frac{\text{m}}{\text{s}^2}$

26. 8kg 12kg 6.5kg

$F_f = 0$

what is the acc of the box hanging on the right?

$m_{\text{sys}} = 8 + 12 + 6.5 = 26.5\text{kg}$

27. What is Free fall?

$14.7\text{N} = 26.5\text{kg} (a)$

$.55 \frac{\text{m}}{\text{s}^2} = a$

28. What is terminal velocity?

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

