A-Day: due Wed., 10/24 (Assigned 10/22)
B-Day: due Thurs., 10/25 (Assigned 10/23)

2007 Forces 1

1. Inertia	A. An action that can cause motion.	**Which of Newton's Three Laws Applies?**
2. Mass	B. Force pulling all objects toward each other.	___ 6. When you put a book on a table the table pushes back on the book.
3. Gravity	C. The amount of matter in an object	___ 7. A person is pushed forward into their seatbelt when a car stops.
4. Net force	D. Total of all of the forces on an object.	___ 8. A larger car takes more force to move.
5. Force	E. Ability of an object to resist change of motion.	___ 9. A person leans on a wall and the wall pushes back.
		___ 10. A brick sits on a table until you push on it.

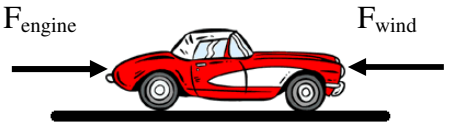
11. For each of the following pairs of objects, which one has more inertia?

A) A freight train or a car?
B) A ping pong ball or a baseball?
C) A fast bowling ball or a slow bowling ball?
D) A 20 kg mass or a 10 kg mass?
E) A rock on the earth or a rock in space?
F) A fast baseball or a bowling ball at rest?

12. Accelerating or not (Y or N)?

A. _____Vi = Vf?
B. _____$a \neq 0$?
C. _____An object changing directions?
D. _____An object thrown into the air at the very top?
E. _____At constant speed?
F. _____Changing speeds?
G. _____$\Delta v = 0$ m/s?
H. _____ $a = 0$ m/s^2?

Let's use something you already know to help us understand net forces and acceleration. Use the picture at the right to answer the following.



13. If the force of the engine is greater than the force of the wind ($F_{engine} > F_{wind}$),
    A. Is the car's acceleration positive or negative?
    B. Is the net force (total of all forces, F_{net}) positive or negative?
    C. The change of velocity (Δv) is positive or negative?

14. If $F_{engine} < F_{wind}$,
    A. Is the car's acceleration positive or negative?
    B. Is F_{net} positive or negative?
    C. The change of velocity (Δv) is positive or negative?

15. $F_{engine} = F_{wind}$,
    A. Is the car's acceleration positive or negative?
    B. Is F_{net} positive or negative?
    C. Is Δv positive or negative?

16. When the car is at rest ($v = 0$),
    A. Is the car's acceleration positive or negative?
    B. Is F_{net} positive or negative?
    C. Is Δv positive or negative?

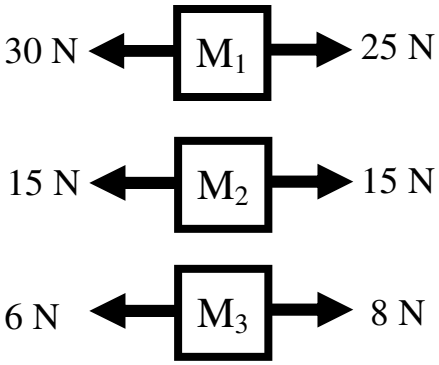
17. Which question or questions above show the object with $F_{net} = 0$N?
18. Which question or questions above show the object with $a = 0$ m/s^2?

A car at cruise control is an example of an object when $a = 0$ m/s^2 OR when $\Delta v = 0$ m/s because it doesn't change speed.

More on Back

19. An object is moving to the left and speeding up.
    A) Is velocity positive or negative?
    B) Is acceleration positive or negative?

20. An object is moving to the right and slowing down.
    A) Is velocity positive or negative?
    B) Is acceleration positive or negative?



21. An object is moving to the right and speeding up.
    A) Is velocity positive or negative?
    B) Is acceleration positive or negative?

    So, remember that an object can be moving left and accelerating to the right, etc.

22. What is the net force on M_1?

23. What is the net force on M_2?

24. What is the net force on M_3?

25. Mass 1, 2, or 3 (above)?

    A. ____ Has balanced forces.
    B. ____ $a \neq 0$?
    C. ____ a is negative.
    D. ____ Could be at rest.
    E. ____ a is positive.
    F. ____ Could be slowing down to the right.
    G. ____ Could be at constant speed.
    H. ____ Could be speeding up to the left.
    I. ____ Could be gaining positive speed.
    J. ____ Could be losing negative speed.

Equilibrium—
When all of the forces on an object are balanced.
OR when $F_{net} = 0$ N
OR when $a = 0$ m/s^2 ($\Delta v = 0$m/s).

26. Which of the masses above are at equilibrium?

27. Are these at equilibrium or not?
    A. ____An object at rest
    B. ____An object with 2 m/s^2 of acceleration.
    C. ____A car with cruise control on.
    D. ____An object with a 2 N force pulling to the right and a 2 N force pulling to the left.

28. From the notes:
    A. What are the units for weight?
    B. What are the units for force?
    C. What are the units for mass?

Use the notes (p2) to find the following. Give variables and equations.

29. Find the weight of a 12 kg object.
    Variables: Equation:

30. Find the mass of a 120 N object.
    Variables: Equation: