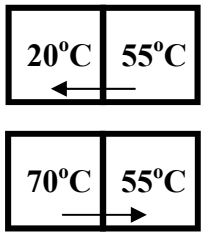
Name: _____

Period: _____

IPC Physics Final Review 2

MA = 5	5 kgm/s
F or F_w = 5 N	5 Ω
d or λ = 5 m	5 w
W or E = 5 J	5
R = 5 Ω	5 sec
I = 5 A	5 N
p = 5 kgm/s	5 m
V = 5 v	5 A
P = 5 w	5 m/s^2
f = 5 Hz	5 V
T = 5 sec	5 Hz
a = 5 m/s^2	5 J

Show heat transfer:



Conduction, convection, or radiation?

Insulator or Conductor?

Metal: C __ Wood: I___

Plastic: I __ Copper: C _

Foam: I ___ Air: I_____

Find the speed of a bike that travels 120 meters in 20 seconds.
S = D/T = 120 m/ 20 sec = 6 m/s

A car starts 10 m away, then drives to 210 meters away in 40 seconds. How fast did they drive?
S = D/T (but D is really ΔD, change of distance).
So S = ΔD/ΔT = 200 m/ 40 sec = 5 m/s

What force results in 3 m/s^2 of acceleration to a 15 kg mass?

F = ma = (15 kg) x (3 m/s^2) = 45 N

A car speeds to 250 mph in 50 seconds. Calculate acceleration.

a = ΔD/ΔT = 250 mph/ 50 sec = 5 mph/sec

Experimental or Control Variables:

You would not change these in the experiment: *Control*

You are trying to find out if snow tires help a car stop in snow.

You would vary this to figure out how it works: *Experimental*

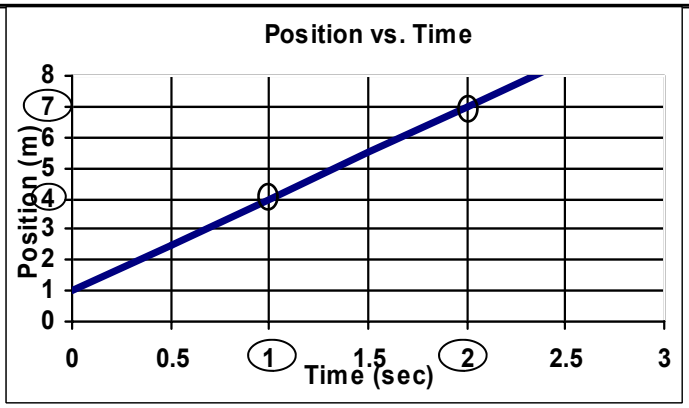
The amount of snow: *CV*

You should have only one of these: *Experimental*

The car used: *CV*

All the other variables are: *CV*

The type of tire: *EV (only thing that varies)*



Where was the object at 2 seconds? *7 meters*

When did the object reach 4 meters? *1 seconds*

Find the slope of the graph (must show work)
Slope = rise/run = Δy/Δx
Δy = 7—4 = 3 m *slope = 3m/1sec = 3 m/s*
Δx = 2—1 = 1 sec
What does the slope you just found stand for? *speed*

A girl is ice skating and has 35 kgm/s of momentum. After she bumps into a friend, she has 25 kgm/s of momentum. How much did she give her friend? *Use Law of Conservation of Momentum: 35—25 = 15 kgm/s*

Which has more inertia: a *bus* or a bike? Why?
The bus has more mass.

Which has more momentum: a house or a *fast airplane*? Why?
A house is not moving (v = 0) so p = 0

A 3 N book rests on a table. Why doesn't it fall?
Newtons's 3rd law—table pushes back with = and opposite 3N force.

When an astronaut lands on the moon, does his mass change?
No, mass is not dependent on gravity.
Does his weight change? Does his inertia change?
Yes, weight is dependent on gravity. No, inertia depends on mass.

Which of Newton's Three Laws Applies?

3__ A rocket moves forward because it pushes out gases from the back.

1__ It is hard to push a car, then hard to stop it.

2__ A 50 N force gives more accelerates to a 5 kg object than a 10 kg object.

Using g = 10 m/s^2, find the weight of a 3 kg mass.
Fw = mg = (3kg)x(10 m/s^2) = 30 N

A person walks 5 m/s for 60 seconds. How far did they walk?
S = D/T *D = 5 x 60 = 300 m*
so, D = ST

A 45 N force pulls to the left and friction is 15 N. Find the net force: *45N—15N = 30 N to the left*

What acceleration will the above net force give a 3 kg mass?
F = ma *a = 30/3 = 10 m/s^2*
so, 30N = 3(a)

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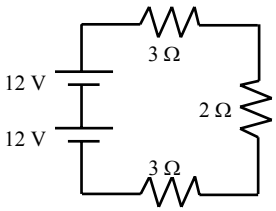
Final Review 2

A piece of wood is burned and releases 55 joules of chemical energy. 30 J is transformed into thermal energy, 15 J is transformed into mechanical energy. By the Law of Conservation of Energy, how much energy becomes radiant energy? $E_{before} = E_{after}$
Must be 55 J after, so 55 J—30 J—15 J = 10 J of radiant energy.

You increase the current in an electromagnet. The strength of the electromagnet *increases* or decreases?



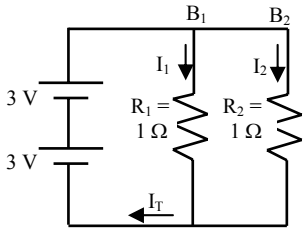
Series or Parallel?

V_T = 24 v _____

R_T = 8 Ω_____

I_T = V/R = 3 A __

P = VI = 72 w __



Series or *Parallel*?

V_T = 6 v_____ I_T = 12 A _____

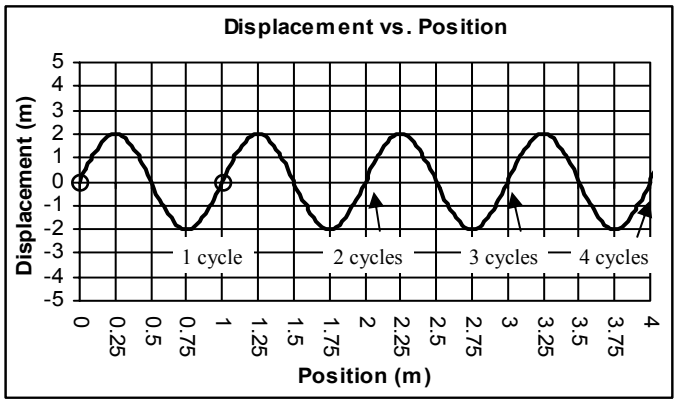
I_1 = V/R = 6 A _ R_T = V/I = 0.5 Ω

I_2 = 6 A _____ P = VI = 72 w _

Naffet (in *kurls*) → $\mathbf{n = \frac{G}{C}}$ ← Gorts (in *lyrs*); ← Cintros (in *tr/i*)

Naffet equals Gorts divided Cintros

How much Naffet does a 12 lyr box have when given 4 tr/i.
n = G/C = 12 lyr/ 4 tr/i = 3 kurls
(This not a real equation. It's an exercise in reading equations.)



Mark 1 cycle of the wave.

Starting at 0.75 m, where does the 2nd cycle end: *2.75 m*

Number of complete cycles: *4*

Wavelength: *1 m* Amplitude: *2 m*

Find the speed of a 12 Hz wave with a 5 m wavelength.
v = fλ = (12Hz)(5m) = 60 m/s

Is the person doing work?

Y _ When pushing a 1000 N car 20 meters?

Y _ When lifting a rock off the ground?

N _ When holding a book in their hands?

A person is hammering nails a long way from you. It takes 2 seconds for the sound to get to you. How far away are they?
S = D/T *speed of sound = 340 m*
so, D = TS = 340 x 2 = 680 m
Make these twice as loud: 60 dB to *80 dB ;* 25 dB to *55 dB.*

Make these half as loud: 100 dB to *80 dB* 35 dB to *15 dB*.

In 2 seconds, a 3 N force pushes for 6 m to cause a 25 kg object to end up going 10 m/s.

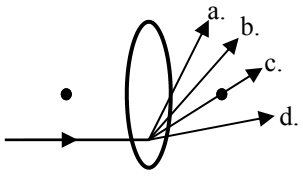
1) Find the momentum of the object
p = mv = 25kg x 10 m/s = 250 kgm/s

2) Calculate the object's final kinetic energy.
Ek = 1/2 (m)(v)²
Ek = 1/2(25kg)(10)² = 1/2(25)(100) = 25(50) = 1250 J

3) A how much work is done to accelerate the object?
W = Fd = 3N x 6 m = 18 J

4) How much power was used on the object?

P = W/t = 18J/2 sec = 9 watts



Where will the income ray go? C.
What is the dot called?
Focal point or focus
Why does the light bend?
refraction
Concave or *convex* lens?

Find its period: *T = 1/f = 1/200 = 0.005 sec*

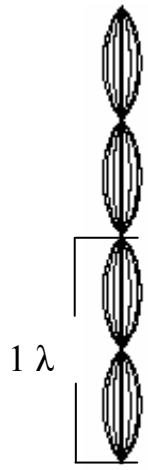
What harmonic is this? *4th (4 antinodes)*

Could a human hear this frequency? *Yes*
Mark the nodes and anti-nodes.
Mark one wavelength.
How many wavelengths total is it? *2*
Find the fundamental frequency:

f_f = 200/4 = 50 Hz

5th harmonic frequency:

f_{Hx} = 50 Hz x 5 = 250 Hz



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