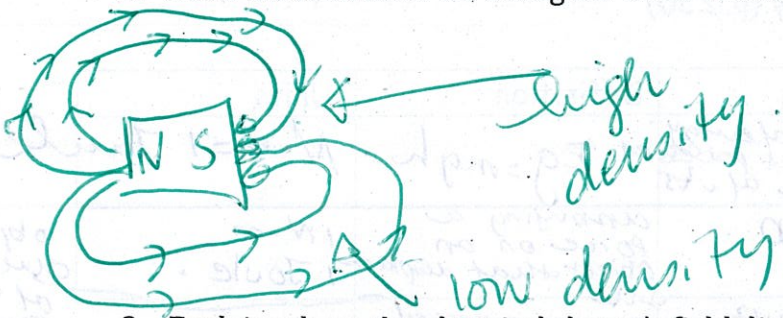
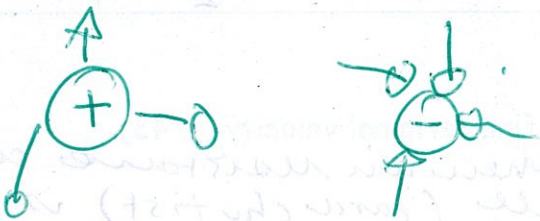
Physics Exam Review

1. Draw the field lines for a magnet. Show where the field density is highest.



2. Explain where the electrical charge's field direction for a negative charge and positive charge.



3. Write how the science, technology and society projects helped you understand concepts in the class. Please make sure that I read this before you leave. - with evidence - videos watched.

4. Draw a free body diagram for all of these examples:

a. an elevator going down an elevator shaft

position in relation to forces in its environment

Review for Energy and Gravity Concepts

Formula Analysis for Energy (p. 230)

1. Energy

Concept	Formula	Definition	Units
Potential Energy	a form of energy an object possesses because of its	$E_g = mgh$.	$N \cdot m = 1$ Joule.
Work	$W = \Delta D$.	applying a force on an object that displaces the	$N \cdot m$ 1 Joule.
Kinetic Energy	$E_K = \frac{MV^2}{2}$.	energy possessed by moving objects	$N \cdot m$ 1 Joule.

object in the direction of the force or a component of the force

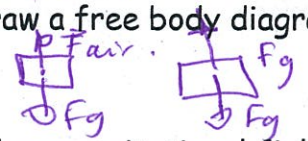
2. Define terminal velocity (p. 43).
When an resistance on a person in free fall (parachutist) is equal to the force of gravity the parachute will stop accelerating.

3. Define and explain sliding friction, p. 169
~~is another~~ object ~~or~~ that is sliding across a surface is called sliding friction, pushing a table or chair across the floor.

4. Define fluid friction or also known as air resistance (p. 169, at the top of the page) Fluid friction or air resistance (also known as drag) is involved when a boat or plane moves through the air.

5. Define and explain what happens when an object is under free fall (p. 162) Free fall is the motion of a falling object where the only force acting on the object is gravity.

6. Draw a free body diagram of an object under free fall (p. 163) (6 conditions)



7. Show gravitational field strength and a force field. (p. 164)

gravitational field strength: the force per unit mass acting on an object when placed in a gravitational field.

Force field is a region of space surrounding an object that can exert force on other objects that are placed within the region and are able to interact with that force.

8. Compare the gravitational field strength to a magnetic and an electric force field. All gravitational and magnetic and an electric force field can attract an object and move it.

9. What is the difference between mass and weight? (p. 165)
Mass is the quantity of matter in an object
Weight is a measure of the force of gravity $\vec{F}_g$ = acting on an object

Healths Key

SPH3U

Name: _____

Exam Review

Concept	Formula	Is work Completed
When an applied force does not result in any motion	$W = F\Delta d$ ↑ 0	None
Uniform motion exists in the absence of a force	$W = F$ ↑ 0	None
The applied force is perpendicular to the displacement	$W = F\Delta d \cos\theta$ ↑ $\cos 90$	No work is completed

Frequency	Wave length	Wave form together
frequency increases	↓ decreases	
frequency decrease	long ↑ increases	

Concept	Does it affect resistance in a conductor
Length of a conductor	Yes or No
Material of the conductor	Yes or No
Temperature of the circuit	Yes or No

SPH3U Name: _____

Calculate Energy in Joules:

A ball dropped at 39 m. 1 kg.

$E_g = mgh = (1.0)(39)(9.81) = 382.59$ Joules.

A 100 kg car moving at 4.5 m/s [E] \

$E_k = \frac{1}{2}mv^2 = \frac{1}{2}(100)(4.5^2) = 1012.5$ Joules.

What is the heat required to evaporate 23 g of water?

$Q = mL_v = (0.023\ kg)\left(2.3 \times 10^6 \frac{J}{kg}\right) = 52\,900$ Joules

What is the energy required to freeze 124 g of water?

$Q = mL_f = (0.124)\left(3.4 \times 10^5 \frac{Joules}{kg}\right) = 42\,160$ Joules.

Calculate the cost of energy used for one family 249 hr of off peak (0.075 $ ON) 566 hr of mid peak $0.112 kWh, and 355 of on peak usage $0.135? What advice would you give a family to help reduce their energy bill. Assume that the family does not know the exact prices.

249 hr x 0.075 - off peak.
566 x 0.112 - mid peak
355 x (0.135) - on peak

18.675 Total off Peak
63.392 Total mid peak.
47.925 - Total on peak.

I would use the AC less often.
Also, I would turn off appliances during on peak hours.

SPH3U Name_____

1. What is the R equivalent for a 3Ω lamp, 4 Ω lamp and 24 Ω lamp.

$\frac{1}{R_{eq}} = \frac{1}{3} + \frac{1}{4} + \frac{1}{24} = \frac{8}{24} + \frac{6}{24} + \frac{1}{24} = \frac{15}{24} = \frac{24}{15}$

$= 1.6\ \Omega$.

2. Given a battery is 6.0 V, determine the current of the whole circuit?

$V = IR$

$\frac{V}{R}$

$\frac{6}{1.6} = I$

$3.75 = I$

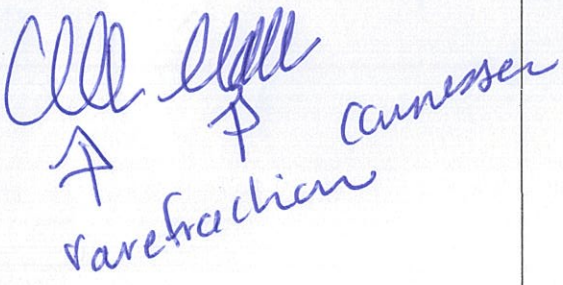
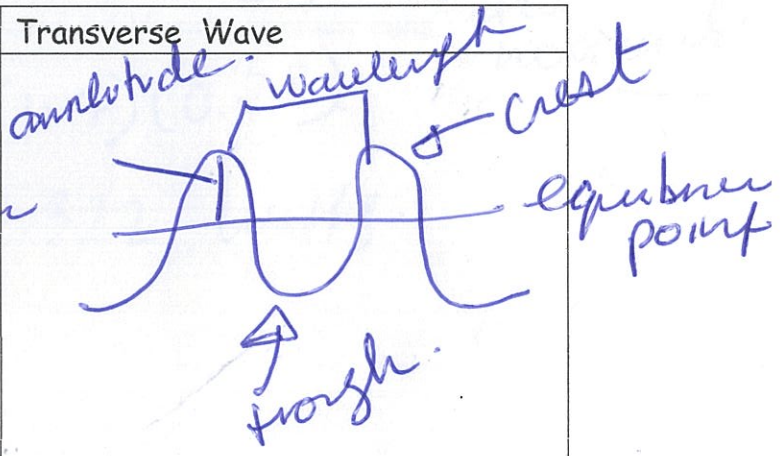
3.75 Amps

3. Determine the current though the 4 Ω lamp.

$\frac{6}{4} = I$

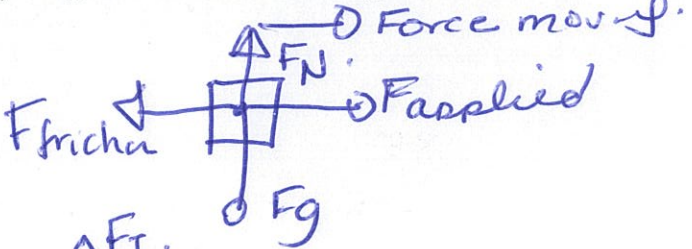
1.5 Amps

5. Compare the longitudinal and transverse wave, name all the parts of the wave.

Longitudinal Wave	Transverse Wave
	

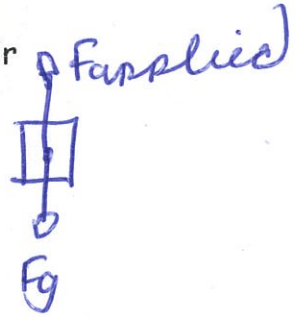
6. Draw a free body diagram of the following scenarios:

A person walking



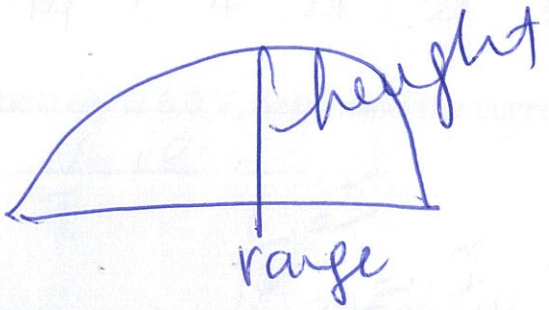
An elevator moving

A person holding an phone air



SPH3U Name_____

A ball is thrown in the air, show the range and height of the ball's path.



Given a ball is thrown for 2.3 seconds in the air with a velocity initial of 12.3 m/s, what is the height of the ball ?

$\Delta d = V_i \Delta t + \frac{1}{2} a_y (\Delta t^2)$.

$= (12.3)(2.3) + \frac{1}{2}(-9.81)(2.3^2) = 3m$

$28.29 + 25.94 = 54.$ m/above the horizontal.

What is power rating of an iPod if it has a 1.4 V and a current runs through it is 0.23 Amp.

$P = (1.4)(0.23)$.

P=IV

$= 0.322$ Watts.