PHY 181: Summer 2023
Worksheet 5

Name: _____ Date: _____

1 Work

Fill in the missing entries in the table below.

$\vec{F}$ (N North)	$\vec{d}$ (m North)	W (J)
10	50	
80	33	
22	100	
75		300
5		25
3		27
	11	33
	0.50	100
	0.25	50

What is the work if the force is 50 lbf North and the displacement is 10 ft East?

2 Energy

2.1 Potential Energy

Fill in the missing entries below. Assume that the objects are on Earth.

m (kg)	h (m)	E_P (J)
100	2	
22	-4	
5		490
2		-98
	20	196
	-5	-392

2.2 Kinetic Energy

Fill in the missing entries in the table below.

m (kg)	v (m/s leftward)	E_k (J)
5	4	
20	5	
4		32
3		48
	3	27
	4	64

3 Conservation of Energy

Suppose that there is an object with a mass of 5kg. It is thrown off of a 50m tall bridge with an initial velocity of 8 m/s downwards. Note that height is measured from the bottom of the ravine. Interpret h = 0 to be just before impact. Fill in the following table.

h (m)	$\vec{v}$ (m/s downward)	E_p (J)	E_k (J)	E_{Total} (J)
50	8			
30				
10				
0				

Suppose that an object with a mass of 5kg is shot with a velocity of 39.2 m/s upwards. Fill in the table below. Please keep at least one digit after the decimal point for each item.

h (m)	$\vec{v}$ (m/s upward)	E_p (J)	E_k (J)	E_{Total} (J)
0	39.2			
58.8				
	0			

4 Power

Fill in the following table.

W (J)	Δ t (s)	P (W)
20	4	
512	64	
30		10
81		27
	5	10
	16	4

Suppose that a mass of 10000kg descends 20m. What is the change in potential energy?

_____

If that mass takes 4 seconds to fall, what is the power that could be extracted if all the converted potential energy were captured?

_____