

Name: \_\_\_\_\_

DISC: \_\_\_\_\_

Score: \_\_\_\_ / 20

## Instructions:

- Do your own work.
- Answer the questions below in the space provided.
- Make sure you show all your work and any equations that you use.
- Please place a box around your answers.
- Remember to give the correct units with all numerical answers

Q1	Q2	Q3	Q4
5	5	5	5

PHYSICAL QUANTITY	SYMBOL	UNITS
Mass	$M$ (or $m$ )	$kg$
Radius	$r$	$m$
Time	$t$	$s$
Weight	$W$	$kg\ m/s^2$

1. The weight of an object due to the Earth's gravity is expressed:  $W = \frac{GMm}{r^2}$ , where  $G$  is known as the *Universal Gravitational Constant* (or just *Gravitational Constant*). Using the information in the table above, find the units on  $G$ .

Answer: 5 pts

2. You are on a hike through the woods. The table below describes the path you took.

STEP	DIRECTION	DISTANCE
1	West	4 km
2	North	3 km
3	30° south-of-east	6 km

Set up a coordinate system, with (0 km, 0 km) your starting point (let the +x-axis be East and the +y-axis be North). Use the blank page at the end of the quiz if you need more room.

Diagram: 2 pts

Coordinates: 2 pts.

Distance: 1 pt.

- Draw your path through the woods in the space below.
- What are the coordinates of your final location?
- How far from the starting point (0 km, 0 km) do you finish?

3. You have a bag which contains 2 types of coins: dimes (\$0.10) and nickels (\$0.05).

The bag:

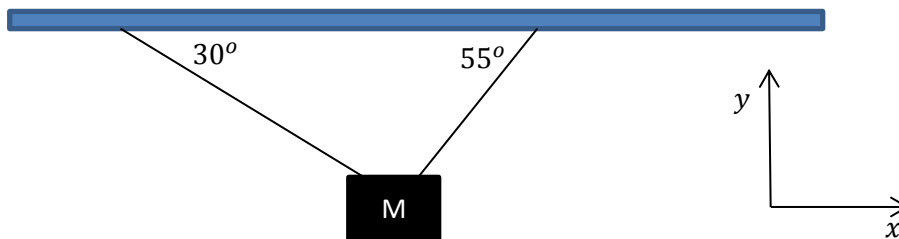
- i. Contains 10 coins.
- ii. Has a total value: \$0.85.

How many dimes and nickels are in the bag?

Dimes:	Nickels:

Dimes: 1 pt.  
Nickels: 1 pt.  
Algebra: 3 pt.

4. A block hangs from the ceiling as shown in the diagram:



- a. The block is in *equilibrium*. What does this mean?

Definition: 2  
pts.

Vectors: 3 pts.

- b. On the diagram above, draw all of the forces vectors *and* their components. Remember to label all of your vectors.

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