Physics 11 Unit 1 – Worksheet #1 - Fg, mass, units

(solutions)

Name: _____

1. Calculate the weight of a 4 kg jug of milk (in Newtons).

$$F_g = mg = (4)(9.8) = 39.2 \; N$$

2. Calculate the force of gravity in Newtons on a 40 kg girl.

$$F_g = mg = (40)(9.8) = 392 \; N$$

3. The force of gravity on a box is 597 N on the surface of the Earth. Find the mass of the box.

$$F_g = mg \rightarrow \quad \frac{F_g}{g} = m = \frac{597}{9.8}$$

$$m = 60.9 \; Kg$$

4.   a) 500 grams = ___.5___ kg

     b) 60 grams = ___.06___ kg

     c) 4 kg = ___4000___ grams

     d) 4 grams = ___.004___ kg

5.   a) 1.5 pounds = ___.681___ kg

     b) 120 pounds = ___54.5___ kg

$$1 \; pound = .454 \; Kg \; (Google \; it)$$

6. If I move a box from the Earth to the moon the _____Mass_____ stays the same but the _____weight_____ changes.

7. The metric units for mass are _____Kg_____

8. The metric units for force are _____Newton_____

9. The imperial units for force are _____pounds_____

10. The imperial units for mass are _____slugs_____ (not used often)

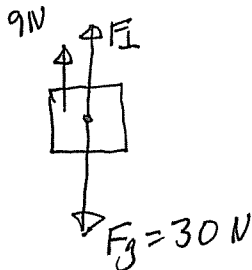11. A 4 kg block is sitting on the table. Find the normal force on the block.

$\hookrightarrow$ means $F_{up} \neq F_{down}$.

$F_{\perp} = F_g = mg = 39.2\,N$

$\hookrightarrow$ normal.

12. A 30 N box is sitting on a table. A string is pulling up on the box with a 9 N force. Find the normal force on the box.
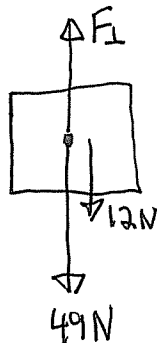

$\hookrightarrow F_{up} = F_{down}$

$9N + F_{\perp} = 30\,N$

$\boxed{F_{\perp} = 21N}$

13. A 5 kg box is sitting on a table. Bob's hand is pushing down on the box with a 12 N force. Find the normal force on the box.

$F_{up} = F_{down}$

$F_{\perp} = 49 + 12$

$\boxed{F_{\perp} = 61\,N}$