

**Reflection and Self-Assessment**

**Part 1:** Circle the statement that best describes how you completed the practice:

- I answered all questions without using the online solutions. I checked my answers against the key at the back of the practice and was able to determine my mistakes and correct them without referring to the online solutions.
- I answered most questions correctly without using the online solutions. I used the online solutions to help me with some questions and was able, with help from the online solutions, to understand every question and answer them correctly.
- I used the online solutions to help me with most of the questions. I was able, with help from the online solutions, to understand each question and answer them correctly.
- Even using the online solutions, I was not able to fully understand the solution to some problems. The questions I had trouble with were:

\_\_\_\_\_

- I did not attempt all the questions on the practice.

**Part 2:** Circle the statement that best describes your confidence in answering questions of this type in the future.

- I am confident I can answer nearly any question of this type correctly without using notes or other assistance.
- I am confident I can answer **MOST** questions of this type correctly without using notes or other assistance.
- I am **NOT** confident I can answer most questions of this type correctly without using notes or other assistance.

1. Determine the force of gravity acting on a 35 kg child on Earth.
2. Determine the force of gravity acting on a 350 kg block on Earth.
3. Explain why the child and the block would have the same acceleration due to gravity ( $9.8\text{m/s}^2$ ), despite the fact the force of gravity acting on them is different.
4. A 350 kg block sits on a floor, draw a FBD with magnitude of gravitational and normal forces labelled.

5. What is the force of gravity acting on a 63 kg block on Earth?
6. What is the weight of a 34 kg block on Earth?
7. What is the mass of an object if its weight is 560 N on Earth?
8. What is the mass of an object if its weight is 720 N on Earth?
9. On the moon  $g=1.6 \text{ m/s}^2$ . What is the weight of a 45 kg object on the moon?
10. On the moon  $g=1.6 \text{ m/s}^2$ . What is the mass of an object if its weight is 254 N on the moon?

11. A 2 500 kg helicopter is hovering above the ground at a particular height. What is the upward force the rotors are providing?

12. A 25 kg object is falling, and as it falls it is accelerating downwards not at  $9.8 \text{ m/s}^2$  but only at  $4.3 \text{ m/s}^2$  due to air resistance.

a. Draw a free body diagram of the object with air resistance and gravity forces shown.

b. What is the net force acting on the object? (Use Newton's second law)

c. What is the magnitude of the air resistance force?

**Apparent Weight**

13. A 55 kg person stands in an elevator accelerating upwards at  $2.5 \text{ m/s}^2$ .
- Draw a FBD of the forces acting on the person (normal and gravity)
  - What is the net force acting on the person and in which direction? (Use Newton's 2<sup>nd</sup> law)
  - What is real weight (force of gravity) of the person? (Use  $F_g = mg$ )
  - What is apparent weight (normal force) of the person?

14. An 88 kg person stands in an elevator accelerating downwards at  $2.5 \text{ m/s}^2$ .

a. Draw a FBD of the forces acting on the person (normal and gravity)

b. What is the net force acting on the person and in which direction? (Use Newton's 2<sup>nd</sup> law)

c. What is real weight (force of gravity) of the person? (Use  $F_g = mg$ )

d. What is apparent weight (normal force) of the person?

15. A person stands in an elevator accelerating at  $4.0\text{ m/s}^2$  upwards. If they have a mass of  $73\text{ kg}$  what will their apparent weight be? What will it appear their mass is?

16. A person stands in an elevator accelerating at  $1.50\text{ m/s}^2$  downwards. If they have a mass of  $64.0\text{ kg}$ , what will their apparent weight be? What will it appear their mass is?


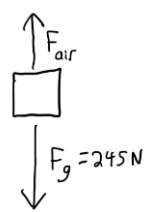


17. Standing on a scale you bend your knees and dip down to a crouch. Will the scale give a reading higher or lower than your actual mass?

18. From a crouch while standing on a scale you quickly stand up. Will the scale give a reading higher or lower than your actual mass?

19. A person gets into an elevator, the elevator accelerates upwards until it is moving at its max speed, continues at that speed for a while and then slows to a stop at the person's floor. Describe how the apparent weight of the person changes throughout the ride.

20. An astronaut is in a rocket accelerating upwards at  $49 \text{ m/s}^2$ . How many times greater than their real weight is their apparent weight?



Answer Key				
1) 340 N	2) 3400 N	3) Acceleration is $\frac{F_{net}}{m}$ , so even though more mass causes $F_{net}$ to increase, it means you divide by a larger number which causes acceleration to be the same.	4) 	5) 620 N
6) 330 N	7) 57 kg	8) 73 kg	9) 72 N	10) 160 kg
11) 25 000 N OR $2.5 \times 10^4$ N	12a) 	12b) 110 N	12c) 140 N	13a) 
13b) 140 N upwards	13c) 540 N	13d) 680 N	14a) 	14b) 220 N downwards
14c) 860 N	14d) 640 N	15) $1.0 \times 10^3$ N, $1.0 \times 10^2$ kg	16) 530 N, 54 kg	17) Lower
18) Higher	19) Above real weight, equal to real weight then below real weight until it stops.	20) 6.0 times greater than real weight		