

Practice Test Questions – Answer Key

1) a. 765 N

b. 125 N

2) a. 95.0 kg

b. 95.0 kg

3) a. 0.418 m/s^2

b. $2.09 \times 10^4 \text{ N}$

4) 15.9 m/s^2

5) 65.0 kg

6) 85.0 m

7) a. An object in motion stays in motion...since the rock is in motion and there is no force working against it, it will continue in a straight line forever.

b. An object at rest stays at rest...when the shuttle takes off, the astronaut is at rest. Once the shuttle blasts off, the astronaut wants to stay at rest even though the shuttle is now moving forward.

c. An object in motion stays in motion...while driving your coffee is traveling at the same speed as you and your car. When you try to stop quickly, the coffee tries to maintain its forward motion and spills out of the cup.

8) 2.5 m/s^2

9) 3290 N

10) 0.747 kg

11) 725 N

12) a. 1.7 m/s^2

b. 0.13 m/s^2

13) 807 N

14) 1600 N

15) For every action force there is an equal (in magnitude) and opposite (in direction) reaction force.

Examples will vary but may include:

- A weightlifter pushes up on a barbell, the barbell pushes down on the weightlifter.
- A high jumper pushes off of the ground; the ground pushes off of the jumper.
- A boxer punches a punching bag and the punching bag hits the boxer's fist.
- As a fish swims it pushes off of the water and the water pushes off of the fish.
- A bat hits a baseball; the baseball hits the bat.

16) They are the same. Whether Student A is pushing off of another student or a wall Student A exerts 500 N and 500 N is exerted on Student A.

17) $F_{\text{net}} = 20 \text{ N}$ $F_{\text{N}} = 200 \text{ N}$ $F_{\text{g}} = 200 \text{ N}$ $F_{\text{f}} = 20 \text{ N}$

19) a. -4.02 m/s^2

b. 61.4 m

20) a. 2.90 m/s^2

b. 1.61 m/s^2

21) 0.0806

22) a. 6.4 m/s^2 to the right

b. 4.8 m/s^2 downwards

23) a. 883 N

b. 1180 N

c. 883 N d. 589 N