



Forces Answers – NAT 5

- 1) The engine gases are pushed backwards.

- 2) The rocket moves with a constant speed.

- 3) Object B accelerates at 9.8ms^{-2} also.

- 4) a) 2450N
b) 2450N
c) 1800J

- 5) a) Wear tight fitting clothes, crouch, streamlined helmet or shoes and solid wheels.
b) Tyres, handle grips, brakes saddle and shoes on pedals.

- 6) a) Tight clothing or tucked position.
b) The forces acting on the skier are equal in magnitude and opposite in direction.
or The forces acting on the skier are balanced.
c) 173,000J **or** $1.73 \times 10^5\text{J}$.

- 7) a) i) It has wheels or rollers.
ii) To make it easier to pull.
b) 300J.

- 8) a) BC and DE.
b) i) 882N.
ii) 0.65ms^{-2} .

- 9) a) $>50\text{m}$ e.g 70m
b) i) 3.5s.
ii) -6400N.
iii) 320,000J **or** $3.2 \times 10^5\text{J}$.

10) a) 1764N

b) 5.2ms^{-2} .

11) a) 0.6ms^{-2} .

b) 24N.

c) The force of friction acts against the motion.

12) a) 3920N.

b) 3960N.

13) a) 6ms^{-2} .

b) 9s.

c) Other forces will act on the plane such as the drag force.
The mass of the plane will also decrease due to fuel consumption.

14) a) i) **Acceleration** is the **change in velocity** per unit time.

ii) The direction and the velocity of the satellite are continually changing.

b) 0.2ms^{-2} to the right.

15) a) i) 0.6s.

ii) 13.6m.

b) 2ms^{-2} .