

# PHYSICS Force Quiz Review

NAME: KEY

Objectives: P3.1A,d P3.2A,C,d P3.4C,e,f

Objectives: P3.1b, 3.1A, P3.6A,B,C,d

Directions: Please show knowns/formula/solutions for full credit.

1. A 500kg mass accelerates at a rate of 45m/s/s. What force was applied?

$$\underline{22,500 \text{ N}} \quad F = ma$$

$$F = 500 \cdot 45 = 22500 \text{ N}$$

2. A dog has a mass of 670 kg. What is his weight in N?

$$\underline{6,566 \text{ N}} \quad F_w = mg$$

$$F_w = 670 \cdot 9.8 = 6566 \text{ N}$$

3. What force is needed to accelerate a mass of 300kg to 30m/s in 2m?

$$\underline{67,500 \text{ N}} \quad \textcircled{1} F = ma \quad \textcircled{2} V_0 = 0 \quad V^2 = V_0^2 + 2ax$$

$$\text{need } a \quad V = 30 \quad 30^2 = 2 \cdot 2a$$

$$\textcircled{3} F = 300 \cdot 22.5 \quad x = 2 \quad 900 = 4a$$

$$67500 \text{ N} \quad a = ? \quad a = 22.5 \text{ m/s}^2$$

4. A 3000kg car goes from 0 to 26m/s in 10s. What force was used?

$$\underline{7800 \text{ N}} \quad \textcircled{1} F = ma \quad \textcircled{2} V_0 = 0 \quad V = V_0 + at$$

$$\text{need } a \quad V = 26 \quad 26 = 10a$$

$$\textcircled{3} F = 3000 \cdot 2.6 \quad t = 10 \quad a = 2.6 \text{ m/s}^2$$

$$7800 \text{ N} \quad a = ?$$

5. If the two masses are being accelerated upwards at 15m/s<sup>2</sup> find the tension in each cable?

$$\underline{2232 \text{ N}}_{T_1}$$

$$\underline{496 \text{ N}}_{T_2}$$

$$\textcircled{1} T_2 = F_w + F_a$$

$$T_2 = (20 \times 9.8) + (20 \cdot 15)$$

$$T_2 = 496 \text{ N}$$

$$\textcircled{2} T_1 = T_2 + F_w + F_a$$

$$T_1 = 496 + (70 \times 9.8) + (70 \cdot 15)$$

$$2232 \text{ N}$$

