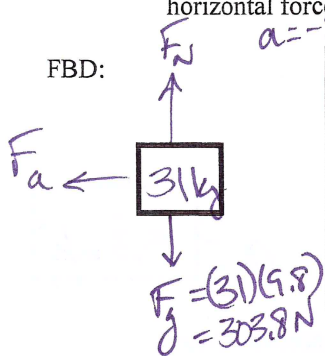


Test 4 Review
(Do Not Turn In)

Name: Key

1. A car hits a guardrail and the passenger in the car is brought to rest with an acceleration of -241 m/s^2 . What horizontal force acts on the passenger's upper torso, which has a mass of 31 kg?

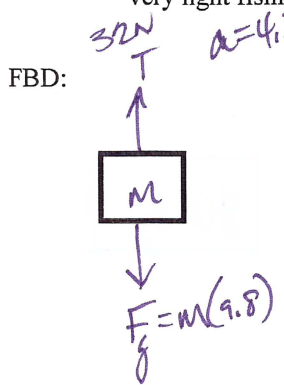


$$\Sigma F_x: \boxed{-F_a = ma}$$

$$-F_a = (31 \text{ kg})(-241 \text{ m/s}^2)$$

$$F_a = \boxed{7471 \text{ N}}$$

2. While fishing at the coast I yanked a fish out of the water vertically with an acceleration of 4.2 m/s^2 using a very light fishing line that had a "test" or maximum tension of 32 N. What was the mass of the fish?



$$\Sigma F_y: \boxed{T - F_g = ma}$$

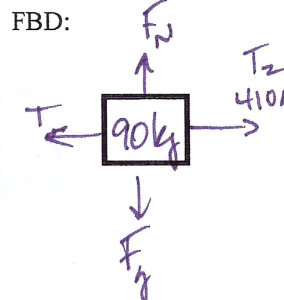
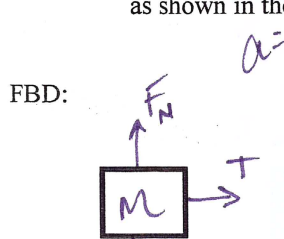
$$32 - m(9.8) = m(4.2)$$

$$32 = m(9.8 + 4.2)$$

$$\frac{32}{14} = \frac{14m}{14}$$

$$m = \boxed{2.29 \text{ kg}}$$

3. Two aliens are accelerated horizontally at a rate of 2 m/s^2 when a strange force of 410 N is applied to the rope as shown in the picture. If Alien B has a mass of 90 kg, what is the mass of Alien A?



$$\Sigma F_x: \boxed{T = ma}$$

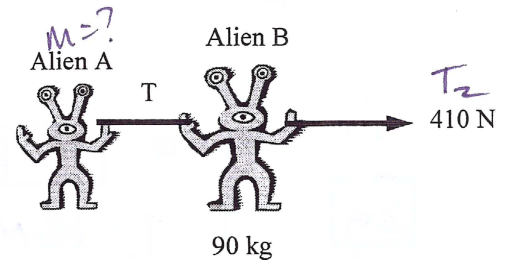
$$\frac{230 \text{ N}}{2 \text{ m/s}^2} = \frac{m(2 \text{ m/s}^2)}{2 \text{ m/s}^2}$$

$$\Sigma F_x: \boxed{T_2 - T = ma}$$

$$410 \text{ N} - T = (90 \text{ kg})(2 \text{ m/s}^2) = 180 \text{ N}$$

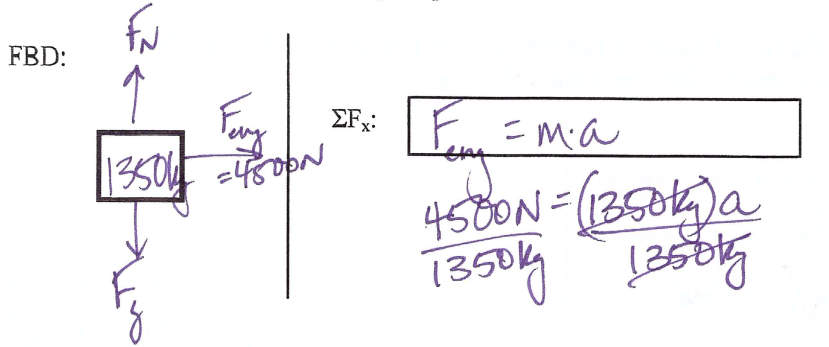
$$T = 410 \text{ N} - 180 \text{ N}$$

$$T = \underline{230 \text{ N}}$$



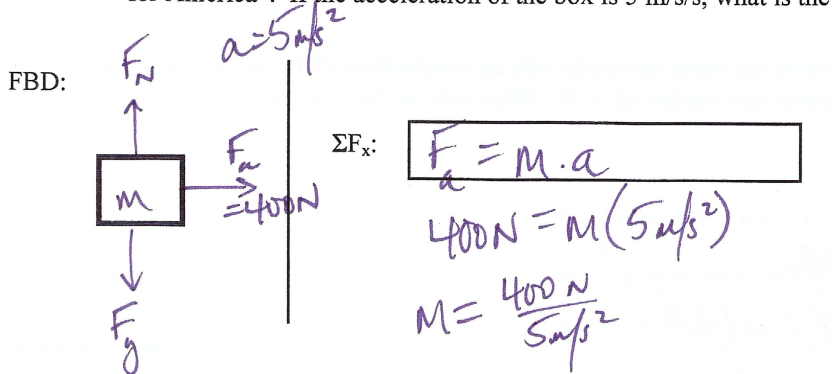
$$M = \boxed{115 \text{ kg}}$$

4. The engine of a 1350 kg car provides a horizontal force of 4500 N. What is the car's acceleration?



$a = 3.3 \text{ m/s}^2$

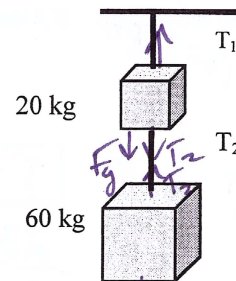
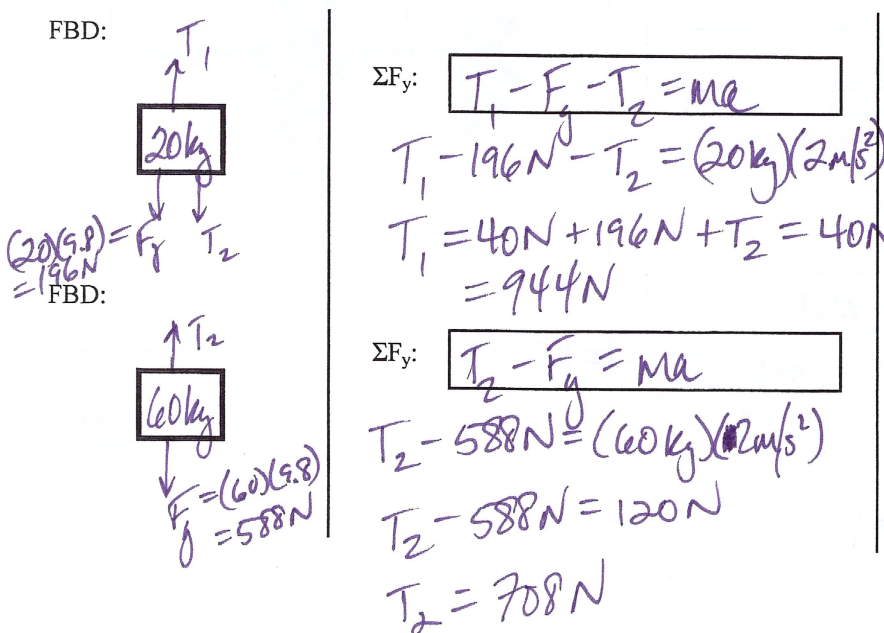
5. A horizontal force of 400 N is applied to a box containing patriotic gazelle costumes for the gazelles' "March for America". If the acceleration of the box is 5 m/s², what is the mass of the box?



80 kg

- 6,7. Two blocks are fastened to the ceiling of an elevator as shown. The acceleration of the system is 2.0 m/s².

$a = +2.0 \text{ m/s}^2$
 Find T1 and T2.



T1 944N
 T2 708N