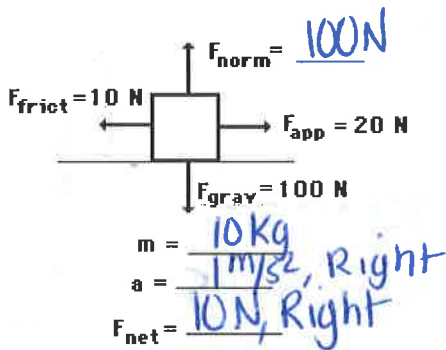


Academic Physics
Net F = ma Practice

Name KEY
Date _____

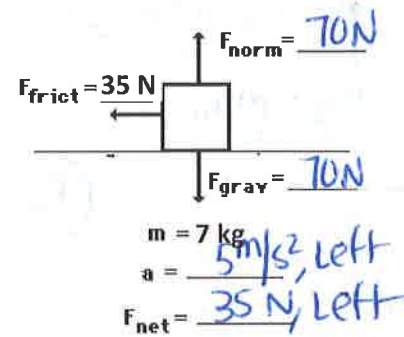
$F_g = ma_g$	$\text{net } F = ma$	$v_f = v_i + at$	$x = v_i t + \frac{1}{2} at^2$	$v_f^2 = v_i^2 + 2ax$	$x = \frac{1}{2} (v_i + v_f)t$
--------------	----------------------	------------------	--------------------------------	-----------------------	--------------------------------

1. An applied force of 20 N is used to accelerate an object to the right across a frictional surface. The object encounters 10 N of friction. Use the diagram to determine the normal force, the net force, the mass, and the acceleration of the object.



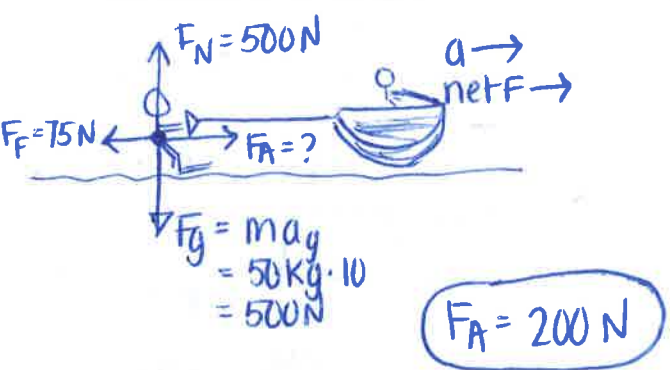
$\text{net } F = ma$
 $10 \text{ N} = 10 \text{ kg} \cdot a$
 $a = 1 \frac{\text{m}}{\text{s}^2}, \text{ Right}$

2. 7-kg object is sliding to the right and encountering a friction force of 35 N which slows it down. Determine the force of gravity, the normal force, the net force, and the acceleration.



$\text{net } F = ma$
 $35 \text{ N} = 7 \text{ kg} \cdot a$
 $a = 5 \frac{\text{m}}{\text{s}^2}, \text{ Left}$

3. On vacation, Jill tries water skiing for the first time and has a successful time standing up out of the water. She is being pulled by a motor boat and experiences 75 N of friction from the surface of the water. The combined mass of Jill and her skis is 50 kg. What is the tension in the rope connecting her to the boat?



$F_A = 200 \text{ N}$

$$\text{net } F = ma$$

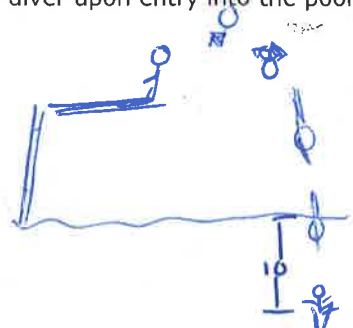
$$F_A - F_F = ma$$

$$F_A - 75 = 50 \cdot 2.5 \frac{\text{m}}{\text{s}^2}$$

$$F_A - 75 = 125$$

$$+ 75 \quad + 75$$

4. A 50 kg diver on the swim team does a back flip off the spring board and enters the water with a velocity of 10 m/s. After hitting the water the diver comes to rest 10 m below the surface. What is the average net force that the water exerts on the diver upon entry into the pool?



$x = 10 \text{ m}$
 $v_i = 10 \frac{\text{m}}{\text{s}}$
 $v_f = 0$
 $a = ?$

$$\text{net } F = ma$$

$$\text{net } F = 50 \cdot (-5)$$

$\text{net } F = -250 \text{ N}$

$$v_f^2 = v_i^2 + 2ax$$

$$0 = 100 + 2(a)(10)$$

$$-100 = 20a$$

$$a = -5 \frac{\text{m}}{\text{s}^2}$$