in the given values for Force/Mass/Acceleration to solve.

2a

1. How much force is needed to accelerate a 66 kg skier at 2 m/s²?

Formula:	Plug in numbers:	Answer:
$F=ma$	$F=(66\text{ kg})(2\text{ m/s}^2)$	132 N

2. What is the force on a 1000 kg elevator that is falling freely at 9.8 m/s²?

Formula:	Plug in numbers:	Answer:
$F=ma$	$F=(1000\text{ kg})(9.8\text{ m/s}^2)$	9800 N

3. What is the acceleration of a 50 kg object pushed with a force of 500 N?

Formula:	Plug in numbers:	Answer:
$F=ma$	$\frac{500\text{ N}}{50}=\frac{(50\text{ kg})(a)}{50}$	10 m/s^2

4. The mass of a large car is 1000 kg. How much force would be required to accelerate the car at a rate of 3 m/s²?

Formula:	Plug in numbers:	Answer:
$F=ma$	$F=(1000\text{ kg})(3\text{ m/s}^2)$	3000 N

5. A 50 kg skater pushed by a friend accelerates 5 m/s². How much force did the friend apply?

Formula:	Plug in numbers:	Answer:
$F=ma$	$F=(50\text{ kg})(5\text{ m/s}^2)$	250 N

6. A force of 250 N is applied to an object that accelerates at a rate of 5 m/s². What is the mass of the object?

Formula:	Plug in numbers:	Answer:
$F=ma$	$\frac{250\text{ N}}{5}=\frac{m(5\text{ m/s}^2)}{5}$	50 kg

7. A bowling ball rolled with a force of 15 N accelerates at a rate of 3 m/s²; a second ball rolled with the same force accelerates 4 m/sec². What are the masses of the two balls?

Formula:	Plug in numbers:	Answer:
$F=ma$	$\frac{15\text{ N}}{3}=\frac{m(3\text{ m/s}^2)}{3}$ $\quad\frac{15\text{ N}}{4}=\frac{m(4\text{ m/s}^2)}{4}$	$m=5\text{ kg}$ $m=3.75\text{ kg}$

8. If a 60 kg person on a 15 kg sled is pushed with a force of 300 N, what will be person's acceleration? ~~+ the~~ sled?

Formula:	Plug in numbers:	Answer:
$F=ma$	$\frac{300\text{ N}}{60+15}=\frac{(60\text{ kg}+15\text{ kg})\,a}{60+15}$	4 m/s^2

9. A force of 20 N acts upon a 5 kg block. Calculate the acceleration of the object.

Formula:	Plug in numbers:	Answer:
$F = ma$	$\frac{20N}{5} = \frac{5kg\,(a)}{5}$	$4\ m/s^2$

10. An object of mass 300 kg is observed to accelerate at the rate of 4 m/s^2. Calculate the force required to produce this acceleration.

Formula:	Plug in numbers:	Answer:
$F = ma$	$F = (300kg)(4\ m/s^2)$	1200 N

11. An object of mass 30 kg is in free fall in a vacuum where there is no air resistance. Determine the acceleration of the object.

Formula:	Plug in numbers:	Answer:
$F = ma$	the object is in free fall →	$-9.8\ m/s^2$

12. A 50,000N car is accelerating at a rate of 2 m/s^2. What is the mass of the car?

Formula:	Plug in numbers:	Answer:
$F = ma$	$\frac{50{,}000N}{2} = m\left(\frac{2\ m/s^2}{2}\right)$	25,000 kg

13. What is the weight of an object that has a mass of 10 kg?

Formula:	Plug in numbers:	Answer:
$F_w = mg$	$F_w = (10kg)(9.8\ m/s^2)$	98 N

14. What is the weight of an object that has a mass of 40 kg?

Formula:	Plug in numbers:	Answer:
$F_w = mg$	$F_w = (40kg)(9.8\ m/s^2)$	392 N

15. What is the mass of an object that weighs 147 N?

Formula:	Plug in numbers:	Answer:
$F_w = mg$	$\frac{147N}{9.8} = m\left(\frac{9.8\ m/s^2}{9.8}\right)$	15 kg

16. What is the mass of an object that weighs 2000 N?

Formula:	Plug in numbers:	Answer:
$F_w = mg$	$\frac{2000N}{9.8} = m\left(\frac{9.8\ m/s^2}{9.8}\right)$	204 kg