Force Diagrams 2

Name_

In this worksheet, you will be creating free body diagrams for each story problem. Please follow these rules for each diagram:

- 1) Create arrows for each force in the correct direction. Larger arrows are for larger forces, small arrows represent smaller forces.
- 2) Label each force with the correct name/label
- 3) Put the force magnitude on each arrow in NEWTONS.

Most force magnitudes will be given to you, but you will need to calculate the force of gravity for each example. You can calculate F_g by multiplying the object mass by acceleration due to gravity. Remember that Acceleration due to gravity (g) is always **9.8 m/s**². (F_g = mg)

1. A ball with mass of 2 kg is falling in the air straight downwards. If the air resistance is 5 Newtons, please draw a force diagram for the ball as it falls.

2.
Formula Work/Answer

$$F_g=?$$

 $m=$ $F_g=mg$
 $g=$

2. A statue with mass 100 kg is standing on the ground, sitting motionless. Please diagram the force(s) acting on the ball.



3. A ball with mass of 20 kg is free falling from an airplane (meaning no air resistance). Please diagram the force(s) acting on the ball.

	Formula	Work/Answer
Fg=?		
m=	F _g = mg	
g=		

4. A shopping cart with mass of 10 N is being pushed with a rightward force of 100 N. There is friction between the cart and the ground of 10 N. There is no air resistance. Please diagram the forces acting on the cart

	Formula	Work/Answer	
F _g =?			
m=	F _g = mg		
g=			

5. A ball of 30 kg has reached terminal velocity (meaning the force of drag is equal to the force of gravity). This also means that the ball is no longer accelerating, but it is moving downwards at a constant velocity. Please diagram the force(s) acting on the ball. Formula Work/Answer

$$F_g=?$$

m= $F_g=mg$
g=

6.A man is holding a pair of shoes by the strings. The shoes have a mass of 5 kg, and he is pulling up with a force of 30 Newton's. Please diagram the forces acting on the shoes.

	Formula	Work/Answer	
Fg=?			
m=	F _g = mg		
g=			

7. A hockey puck with mass of 1 kg is sliding across ice (<u>no applied force any more</u>) in a leftwards direction. The force of friction is 1 N. Please diagram the forces acting upon the puck.

	Formula	Work/Answer	
Fg=?	_		
m=	F _g = mg		
g=			

8. An airplane of mass 1000 kg is flying with a forward force of 500 N. It is being lifted with a force equal to the force of gravity, and there are 50 N of friction. Diagram!

Work/Answer

Formula F_g=? m= **F**g= mg g=



