

EXAM 2

Name: _____

Student ID #: _____

TA (circle one): Cook Costello Flitcroft Johnson Young

A. [6 pts.] The planet Nahar has 1/5 the mass of the earth and its radius is 1/5 that of the earth. On Nahar Rose has a mass of 50 kg.

1. What is Rose's mass on earth?

50 kg

2. What is Rose's weight on earth?

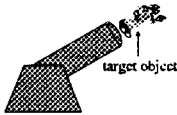
$$W = mg = (50 \text{ kg})(9.8 \text{ m/s}^2) = 490 \text{ N}$$

3. What is Rose's weight on Nahar?

$$W = mg_{\text{NAHAR}} = 5mg_E = 2450 \text{ N}$$

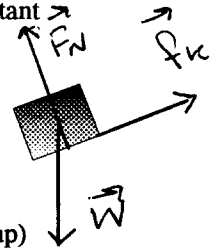
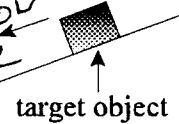
B. [17 pts.] Below are depictions of situations in which the target object is subject to one or more forces. To the right of each picture construct a free body diagram. In that diagram each identified force must be accompanied by an arrow and a label using notation seen in lecture. Assume air resistance plays no role.

a. Clown shot out of a cannon

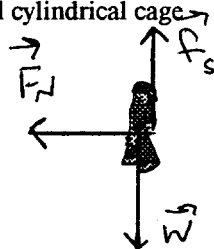
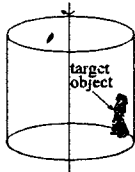


b. Block sliding down incline at constant speed

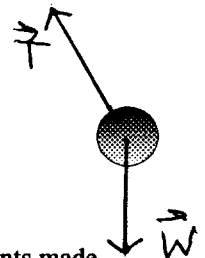
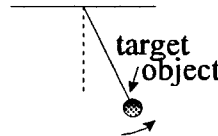
2 PTS EACH
 CORRECT ARROW
 WITH LABEL



c. Patron in amusement park ride: rotating steel cylindrical cage



d. Bob on end of pendulum (on way up)



In the following enter a, b, c, d, none, or all of the above situations that best fit the statements made.

1. b Those pictures for which $\vec{F}_{\text{net}} = 0$.

2. a Those pictures for which \vec{F}_{net} is due only to the weight on the object.

3. NONE Those pictures for which \vec{F}_{net} points vertically straight upward.

4. NONE Those pictures for which weight is not one of the forces felt by the object.

C. [10 pts.] The following picture shows the motion of a lead shot put ball (no air resistance) after it leaves the "putter's" hand, but before it hits the ground. Note: B and D are at the same vertical elevation. A-E identify points along the flight of the shot put. For the statements below enter A, B, C, D, E, all, or none that best fit.

1. C The point where PE is largest.

2. E The point where KE is largest.

3. C The point where speed is least.

4. NONE The point where the ball's acceleration is zero.

5. BD The points between which the work done by the gravitational force is zero.

