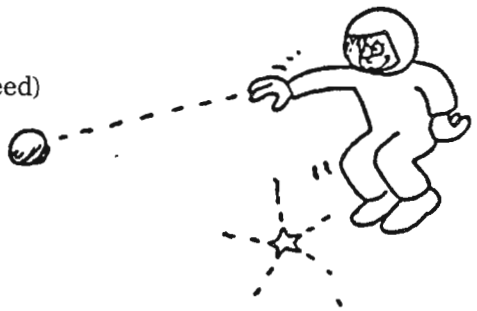
Name Period Date

Concept-Development Practice Page 4-1

1. (*Circle the correct answer.*) An astronaut in outer space away from gravitational or frictional forces throws a rock. The rock will

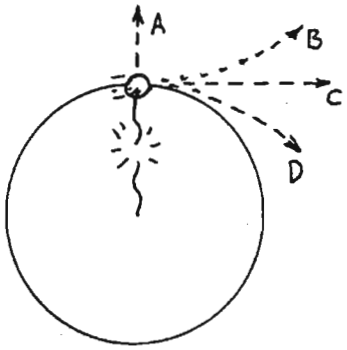


(gradually slow to a stop)

(continue moving in a straight line at constant speed)

The rock's tendency to do this is called

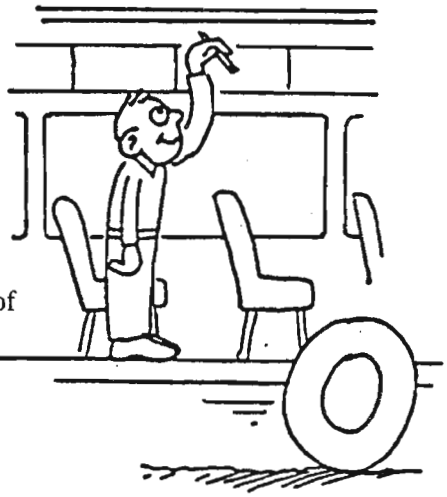
(inertia) (weight) (acceleration)

2. 

The sketch shows a top view of a rock being whirled at the end of a string (clockwise). If the string breaks, the path of the rock is

(A) (B) (C) (D)

3. Suppose you are standing in the aisle of a bus that travels along a straight road at 100 km/h, and you hold a pencil still above your head. Then relative to the bus, the velocity of the pencil is 0 km/h, and relative to the road, the pencil has a horizontal velocity of



(less than 100 km/h) 100 km/h) (more than 100 km/h)

Suppose you release the pencil. While it is dropping, and relative to the road, the pencil still has a horizontal velocity of

(less than 100 km/h) (100 km/h) (more than 100 km/h)

This means that the pencil will strike the floor at a place directly

(behind you) (at your feet below your hand) in front of you)

Relative to you, the way the pencil drops

(is the same as if the bus were at rest)

(depends on the velocity of the bus)

How does this example illustrate the law of inertia?

_____

_____

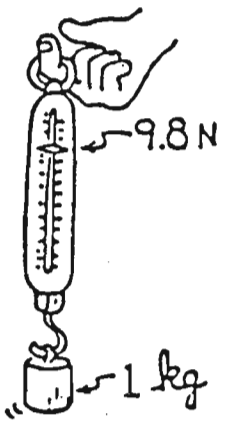
_____

Conceptual PHYSICS

4. Use the words *mass*, *weight*, and *volume*, to complete the table.

The force due to gravity on an object	
The quantity of matter in an object	
The amount of space an object occupies	

5. Different masses are hung on a spring scale calibrated in newtons.



The force exerted by gravity on 1 kg = 9.8 N.

The force exerted by gravity on 5 kg = _____ N.

The force exerted by gravity on _____ kg = 98 N.

Make up your own mass and show the corresponding weight:

The force exerted by gravity on _____ kg = _____ N.

6. By whatever means (spring scales, measuring balance, etc.), find the mass of your physics book. Then complete Table I.

OBJECT	MASS	WEIGHT
MELON	1 kg	
APPLE		1 N
PHYSICS BOOK		
UNCLE HARRY	90 kg	

Table I

7. Why isn't the girl hurt when the nail is driven into the block of wood?

_____

_____

Would this be more dangerous or less dangerous if the block were less massive _____? Explain.

_____

_____

_____

CAUTION: Safety dictates you not try this experiment yourself.

4 Forces and Newton's Laws of Motion

4.1 What Causes Motion?

4.2 Force

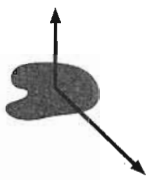
1. Using the particle model, represent the force a person exerts on a table when (a) pulling it to the right across a level floor with a force of magnitude F, (b) pulling it to the left across a level floor with force $2F$, and (c) *pushing* it to the right across a level floor with force F.

a. Table pulled right with force F

b. Table pulled left with force $2F$

c. Table pushed right with force F

2. Two or more forces are shown on the objects below. Draw and label the net force $\vec{F}_{\text{net}}$.



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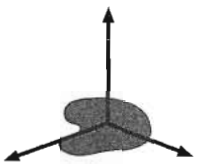
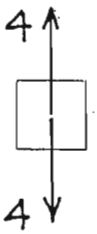


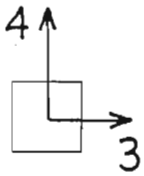
Net Force

Fill in the magnitudes of net force for each case.

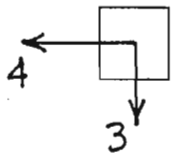


F_{net} = _____

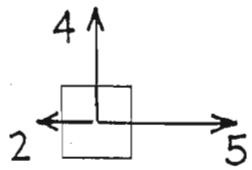
F_{net} = _____



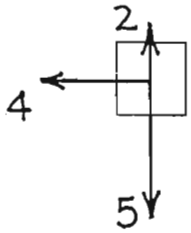
F_{net} = _____



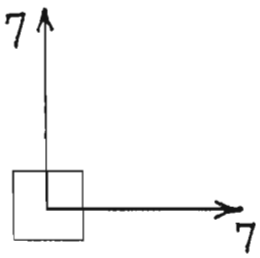
F_{net} = _____



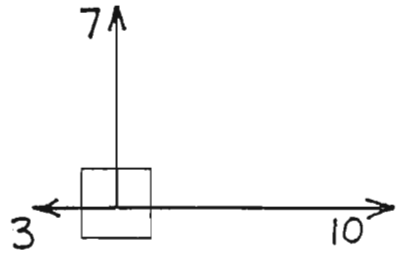
F_{net} = _____



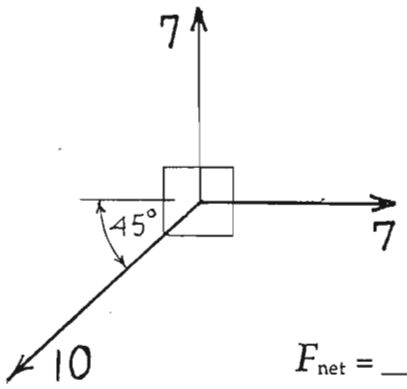
F_{net} = _____



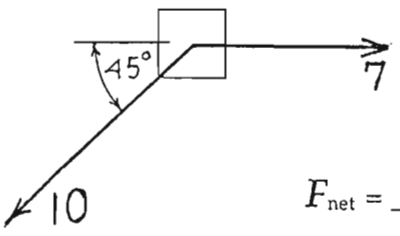
F_{net} = _____



F_{net} = _____



F_{net} = _____



F_{net} = _____

Conceptual PHYSICS