

Fill in your name and I.D. number in both letters and filled circles in the area indicated on the scantron sheet. Use only a #2 pencil. Sign the scantron sheet where indicated. For section, use your lab number. Mark the correct answers on your copy of the test and fill in the answers in the circles on the scantron sheet. Hand in the scantron sheet and keep your test to check answers against the key to be posted outside. **BE SURE TO HAND IN YOUR SCANTRON SHEET IN THE CORRECT COLOR PILE.** Pick the answer closest to yours as some roundoff occurs. There are 10 questions, do them all. This is a one-hour exam.

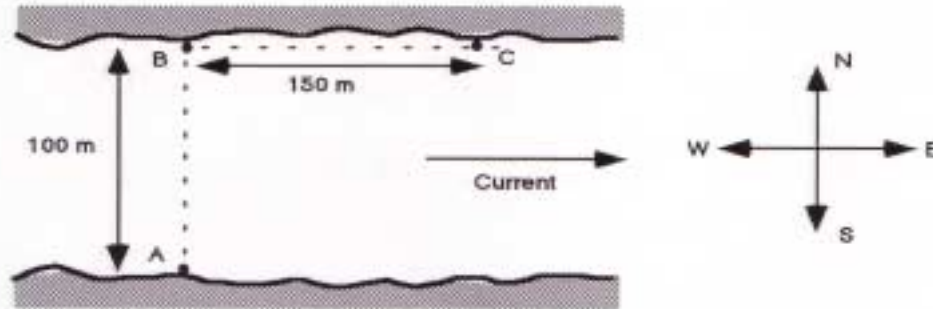
A projectile is fired from a gun and has initial vertical and horizontal components of velocity equal to 40 m/s and 30 m/s respectively.

1. Refer to the information above. Determine the initial speed of the projectile.
 - a. 40 m/s
 - b. 50 m/s
 - c. 60 m/s
 - d. 70 m/s
 - e. 80 m/s

2. Refer to the information above. Approximately how long does it take the projectile to reach the highest point in its trajectory?
 - a. 1 s
 - b. 2 s
 - c. 4 s
 - d. 8 s
 - e. 16 s

3. A car, starting from rest, accelerates in a straight line path at a constant rate of 2.0 m/s². How far will the car travel in 10 seconds?
 - a. 2.0 m
 - b. 10.0 m
 - c. 40 m
 - d. 100 m
 - e. 200m

A man points his rowboat north from A to B, straight across a river of width 100 m. The river flows due east. The man starts across, rowing steadily at 0.75 m/s and reaches the other side of the river at point C, 150 m downstream from his starting point.



4. Refer to the information above. While the man is crossing the river, what is his velocity relative to the shore?
 - a. 1.35 m/s, 34° north of east
 - b. 2.0 m/s, 56° north of east
 - c. 2.0 m/s, 34° north of east
 - d. 2.5 m/s, 34° north of east
 - e. 2.5 m/s, 42° north of east

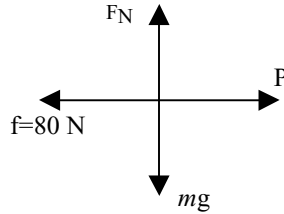
5. What height will be reached by a stone thrown straight up with an initial speed of 40 m/s?
 - a. 41 m
 - b. 82 m
 - c. 98 m
 - d. 164 m
 - e. 400 m

6. A car is initially traveling at 50 km/hr. The brakes are applied and the car stops over a distance of 35 m. What was the magnitude of the car's acceleration while it was braking?
 - a. 2.8 m/s²
 - b. 5.4 m/s²
 - c. 35.7 m/s²
 - d. 71.4 m/s²

e. 98.0 m/s^2

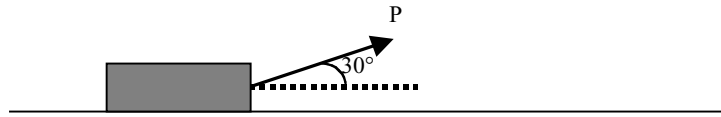
A block is pulled along a rough level surface at a constant speed by the force **P**. The figure below shows the free body diagram for the block.

F_N represents the normal force on the block, and **f** represents the force of kinetic friction.



7. Refer to the information above. What is the reaction force to **mg** that is predicted by Newton's Third Law?
- The normal force, F_N
 - The weight of the block
 - The total force exerted on the block by the surface
 - The upward force exerted on the earth by the block
 - The retarding force exerted on the block by the surface
8. Refer to the information above. If the coefficient of kinetic friction, μ_k , between the block and the surface is 0.30, what is the weight of the block?
- 1.6 N
 - 4.0 N
 - 160 N
 - 267 N
 - 400 N

A block is pulled at a constant speed along a rough level surface by a rope that makes an angle of 30° with respect to the horizontal. The applied force along the rope is \mathbf{P} . The force of kinetic friction between the block and the surface is 10 N.



9. Refer to the information above. Which expression gives the magnitude of the force \mathbf{P} in SI units?
- a. $10 / (\cos 30^\circ)$
 - b. $10 / (\sin 30^\circ)$
 - c. $10 (\cos 30^\circ)$
 - d. $10 (\sin 30^\circ)$
 - e. $\tan 30^\circ$
10. Refer to the information above. The magnitude of the normal force could be reduced by:
- a. increasing the speed of the block.
 - b. increasing the mass of the block.
 - c. decreasing the velocity of the block.
 - d. decreasing the angle made by the rope.
 - e. increasing the angle made by the rope.

Answer Key

PHYSICS 218, Fall 2002

Test #1

GREEN TEST

DATE

1. B

2. C

3. D

4. A

5. B

6. A

7. D

8. D

9. A

10. E