

Last Name: _____
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First Name _____
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ID# _____

Signature _____

Recitation TA: _____

(Nawanath Budhathoki, Hsin-Wei Hsia, Fnu Pinki, Pooja Shrestha, Reshna Shrestha, Arif Ullah)

Recitation Day & Time: _____

- You are allowed a calculator and ONE 8.5"x11" sheet of paper with whatever you wish written on it (both sides).
- You must show ALL your work to receive full credit for regular problems. Numerical answers must have the right units.
- Use the back of the problem page if you need more space and mark OVER on the front to indicate that there is material on the back side.
- For the multiple-choice questions, clearly write the letter of your choice on the front page. No points will be given if two or more choices are circled

Answers to Multiple Choice Questions: (Please write your answers clearly here.)

1.	2.	3.	4.	5.	6.
7.	8.	9.	10.	11.	12.

Please note that giving or receiving aid on an exam or any act of academic dishonesty is cause for dismissal from the University.

<u>Question</u>	<u>Score</u>	<u>Grader</u>
1 - 12	_____	_____
13	_____	_____
14	_____	_____
15	_____	_____
16	_____	_____
<u>TOTAL</u>	_____	_____

USEFUL CONSTANTS:

Acceleration due to gravity: $g = 9.8 \text{ m/s}^2$
(Unless otherwise specified questions apply to objects on Earth.)

Multiple Choice Questions

You do not need to show your work. Please write down the answer on the front page.
No partial credit will be given. (3 points each)

- 1) A fathom is a unit of length used to measure the depth of water. One fathom is approximately equal to 6 ft. If the distance from Buffalo to Rochester is 76.0 miles, what is this distance in fathoms? Use the following conversion factors: 1 mile = 1,609 meters, 1 ft = 0.3048 meters.
A. 401,000 fathoms B. 122,000 fathoms
C. 66,900 fathoms D. 20,400 fathoms

- 2) Vector \vec{A} is 4.00 cm in length and points along the positive y -axis. Vector \vec{B} is 6.00 cm in length and points along the negative x -axis. What angle does vector $\vec{A} + \vec{B}$ make with the positive x -axis?
A. 33.7° B. -56.3° C. 146° D. 123°

- 3) Which equation is dimensionally incorrect? Assume that x has dimension of length, v has dimension of length divided by time, and a has dimension of length divided by the square of time.
A. $t = x/v$ B. $a = v^2/x$ C. $v = a/t$ D. $t^2 = 2x/a$

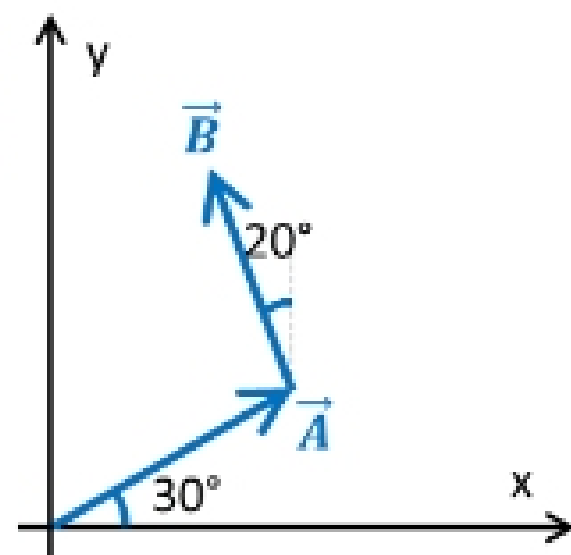
- 4) What is true regarding the average speed and velocity of a flight completed a round trip?
A. The average speed is zero.
B. The average velocity is zero.
C. The average speed is negative.
D. The average velocity is negative.

- 5) A ball is moving to the right with a decreasing speed. If we choose the positive direction to the right, which of the following is correct regarding the acceleration a ?
A. a is positive.
B. a is negative.
C. a could be either positive or negative.
D. a is zero.

- 6) A ball is released from the rest at the top of a building. Which of the following is true?
A. The instantaneous acceleration is zero at the moment when the ball is released.
B. The acceleration is constant.
C. The instantaneous velocity is negative at the moment when the ball is released.
D. The acceleration reaches maximum just before the ball hits the ground.

- 7) If the x-component of an object's velocity is -10 m/s , what can we conclude?
- The object's speed is less than (or equal to) -10 m/s .
 - The object's speed is between -10 m/s and 10 m/s .
 - The object's speed is greater than (or equal to) 10 m/s .
 - The object is decelerating.
- 8) A tomato thrown by a displeased theater patron strikes the stage at the same height as it was thrown. At which time was it moving fastest?
- Just after it was released.
 - When it reached its maximum height.
 - Just before it landed on the stage.
 - The speeds of choices A & C tie for fastest.

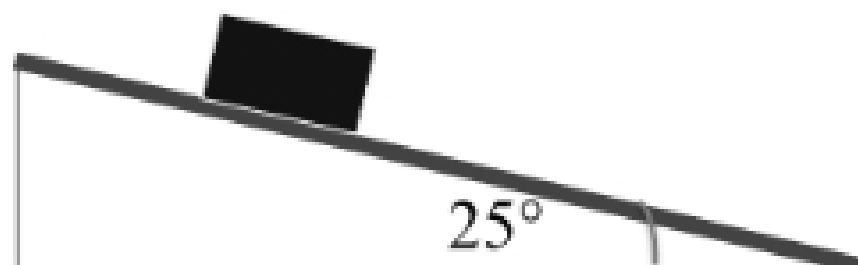
- 9) Vector \vec{A} is 175 m at an angle 30.0° above the $+x$ direction while vector \vec{B} is 150 m at an angle 20.0° counterclockwise from the $+y$ direction, as shown in the figure. The resultant vector $\vec{A} + \vec{B}$ is at an angle:
- $+20.0^\circ$ counterclockwise from the $+x$ direction
 - $+30.0^\circ$ counterclockwise from the $+x$ direction
 - $+66.3^\circ$ counterclockwise from the $+x$ direction
 - $+120.0^\circ$ counterclockwise from the $+x$ direction



- 10) The acceleration due to gravity on the Moon's surface is one-sixth that on Earth. An astronaut's life support backpack weighs 300 lb on Earth. What does it weigh on the Moon?
- $1,800 \text{ lb}$
 - 300 lb
 - 135 lb
 - 50 lb

- 11) A 50 kg crate remains stationary after it has been placed on a ramp inclined at an angle of 25° with the horizontal. The coefficient of static friction between the crate and the ramp is 0.50 and the coefficient of kinetic friction is 0.30 . The magnitude of the frictional force that acts on the crate is:

- 444 N
- 222 N
- 207 N
- 133 N



- 12) A person weighs a fish with a spring scale attached to the ceiling of an elevator. While the elevator is at rest, she measures a weight of 40.0 N . What weight does the scale read if the elevator accelerates downward?

- $< 40 \text{ N}$
- 40 N
- $> 40 \text{ N}$
- It depends on the speed