Name: _____

Seat Assignment: _____

Specify your **EXAM ID** on the right. Use 000 if you do not know your exam ID.

Circle your **LAB SECTION**

	216	217	218
11:10	**A216 Teague**	**C217 Siavash**	**C218 Dhruv**
12:40	**B216 Teague**	**D217 Siavash**	
2:10	**C216 Teague**	**E217 Dhruv**	

0 ○	0 ○	0 ○
1 ○	1 ○	1 ○
2 ○	2 ○	2 ○
3 ○	3 ○	3 ○
4 ○	4 ○	4 ○
5 ○	5 ○	5 ○
6 ○	6 ○	6 ○
7 ○	7 ○	7 ○
8 ○	8 ○	8 ○
9 ○	9 ○	9 ○

Instructions

- Sit in your assigned seat.
- Do not open the exam until instructed to do so.
- Completely color in the dot for your chosen answers on multiple choice.
- Do not leave if there is less than 5 minutes to go in the exam.
- When time is called, immediately stop writing, remain seated, and pass your exam to the center aisle.
- Working after time is called results in an automatic deduction.

Guidelines

- Assume 3 significant figures for all given numbers unless otherwise stated
- Show all of your work – no work, no credit
- Write your final answer in the box provided
- Include units for all answers and directions for all vectors

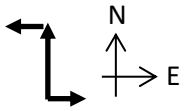
1. (2 pts) Which quantity is NOT represented by a vector:

velocity	acceleration	speed
○	○	○

2. (2 pts) A vector has an x-component of -4 ft and a y-component of +3 ft.
What is the angle of the vector CCW from the +x axis?

37°	143°	217°
○	○	○

3. (2 pts) The approximate direction of the sum of the three vectors is:



NW	N	NE
○	○	○

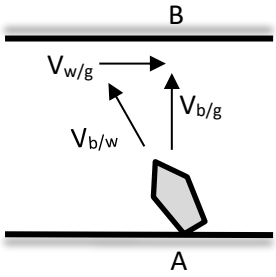
4. (2 pts) A car has a velocity of -45 ft/s and an acceleration of +3.7 ft/s^2. The car is _____.

speeding up	slowing down	moving at constant velocity
○	○	○

5. (2 pts) A blob has a volume of 64 in^3. What is the volume of a 1:4 scale model of the blob?

16 in^3	4 in^3	1 in^3
○	○	○

6. (2 pts) A boat wants to start at point A and end up at point B.
How do these two speeds compare? $V_{b/g}$ ____ $V_{b/w}$



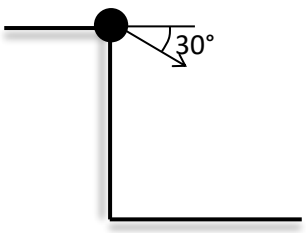
<	=	>
○	○	○

7. (2 pts) What is a reasonable estimate for the volume of standard size refrigerator?

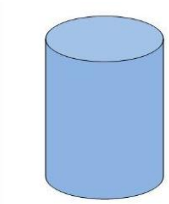
2 ft^3	20 ft^3	200 ft^3
○	○	○

8. (2 pts) A ball is shot downward as shown. Assume ideal projectile motion.
What is the approximate direction of the velocity vector the instant before it hits the ground?

0	30°	almost vertical	vertical
○	○	○	○



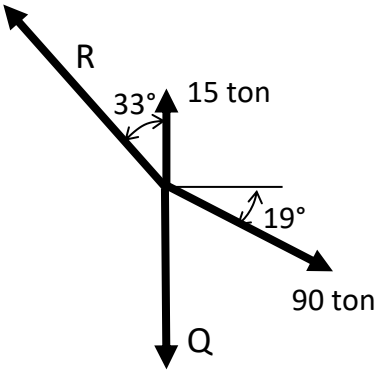
9. (14 pts) **What is the volume of a cylinder in liters** if it has a base of 420 nanoacres and a height of 1.8 wiffles?
   1 liter = 1000 cm^3
   1 'wiffle' = 3.5 inches
   1 nanoacre = 4.047 mm^2
   1 inch = 2.54 cm



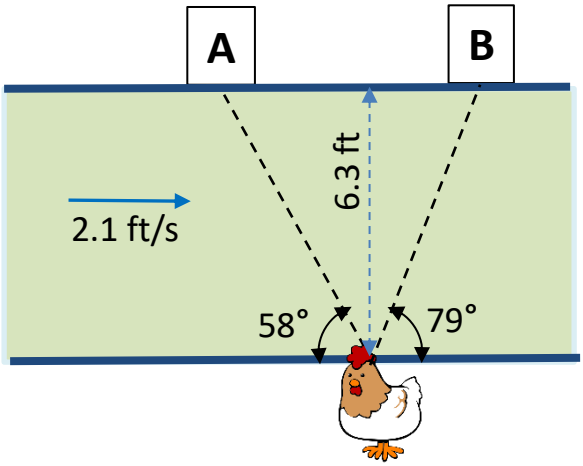
Volume = cross-sectional area * height

10. (14 pts) Prof Maczka rides his bike 2.2 km 33° S of W and then 3.5 km 18° W of N.
What vector will return him to his starting point?
Hint: a vector has a magnitude and direction.

11. (14 pts) What is the **magnitude of the vertical vector Q** if the four forces are in equilibrium? Hint: solve the horizontal equation first.



12. (14 pts) A moving sidewalk is 6.3 ft wide with a speed of 2.1 ft/s to the right. A chicken starts on one side and walks toward point A, but ends up at point B. **How long did it take the chicken to cross the sidewalk?**



13. (14 pts) A race car starts with a speed of 50 ft/s and accelerates at 30 ft/s^2 for 3 seconds. It then drives at a constant speed for 10 seconds.
What was the **total distance traveled?**

14. (14 pts) Prof Schleter hits a golf ball off a cliff (point A) of an unknown planet as shown.
The ball hits the ground at point B 4.8 seconds later.
Assume ideal projectile motion.
What is the **acceleration of gravity on this planet?**
Hint: start with the horizontal direction equation.