Name: _____

Seat Assignment: _____

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

Circle your **LAB SECTION**

	ZEC 270	ZEC 278
9:50 am	**B270 McKensie**	**B278 Graham**
11:30 am	**C270 McKensie**	**C278 McKensie**
1:10 pm	**D270 McKensie**	**D278 Graham**
2:50 pm	**E270 Graham**	**E278 Graham**

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.
- Turn your equation sheets in with your exam.

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. (3 pts) The volume of a person is approximately:

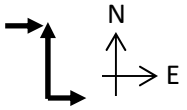
$1\ m^3$	$0.1\ m^3$	$0.01\ m^3$	$0.001\ m^3$
○	○	○	○

2. (3 pts) A vector has an x-component of -4ft and a y-component of 6ft, which quadrant is the vector in?

Quadrant 1	Quadrant 2	Quadrant 3	Quadrant 4
○	○	○	○

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

NW	SW	SE	NE
○	○	○	○

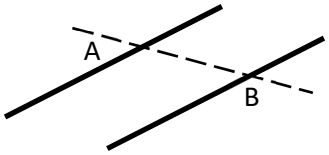


4. (3 pts) Your computer is equipped with a motherboard that is 12.4×10^{-4} meters thick. Which of these is NOT an appropriate representation of this measurement using an SI prefix?

$12.4*10^{-3}$ mm	1.24 mm	1240 µm	0.124 cm
○	○	○	○

5. (3 pts) The thick solid lines are parallel to each other. If A = 40°, angle B is:

40°	50°	130°	140°
○	○	○	○



6. (3 pts) Based on the standard coordinate system (x to the right, y up), the direction of $\hat{\imath} - \hat{\jmath}$ is?

→	↗	↑	↖	←	↙	↓	↘
○	○	○	○	○	○	○	○

7. (3 pts) How many significant figures are in 0.06200?

2	4	5	6
○	○	○	○

8. (3 pts) What is the magnitude of the vector $\hat{\imath} - \hat{\jmath}$?

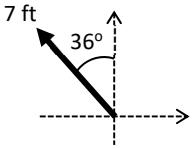
0	1	1.4	2
○	○	○	○

9. (3 pts) Three vectors have different magnitudes given by 4, 5, and 11m. Is it possible for the three vectors to add to zero?

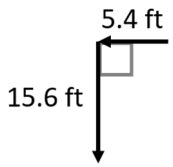
Yes	No	Depends on directions of vectors
○	○	○

10. (3 pts) What is the correct way to express the x-component of the vector shown?

+7 ft * sin(36°)	-7 ft * sin(36°)	+7 ft * cos(36°)	-7 ft * cos(36°)
○	○	○	○



11. (6 pts) Given a vector with the x- and y-components shown, what is the angle when measured CCW from the +x-axis?



12. (6 pts) A roof has a pitch of 4:9, determine the rise in feet if the run is 9 feet - 7 inches.

13. (6 pts) A resupply ship is being designed to use ion engines that run continuously, providing a small but constant acceleration of 0.06 meters per second squared (m/s^2). What is the acceleration of the supply ship in units of miles per hour squared?
Helpful Conversions: 1 meter = 3.28 feet, 1 mi = 5280 ft

14. (6 pts) Given a vector with a magnitude of 12.4 m at 280° CCW from the +x-axis, determine the y-component of the vector?

15. (14 pts) Dr. Maczka walks 27 ft at 38° E of N, and then 34 ft at 18° N of W. How far is Dr. Maczka from his starting point?

16. (14 pts) A gallon of paint can cover 400 ft^2. How many gallons of paint are needed to cover a 1:8 scale model of a 100 yard by 50 yard floor? (1 yard = 3 ft)

Don't forget to turn the page for the last problem.

17. (18 pts) Determine the magnitude of vector Q if the three forces are in equilibrium?