

Name (PRINT): _____

Seat Assignment: ZEC _____ : _____

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
9:45 am	B270 McKensie	B278 Matthew
11:20 am	C270 McKensie	C278 Katy
12:55 pm	D270 Matthew	D278 Katy
2:30 pm	E270 McKensie	E278 Katy

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 ○

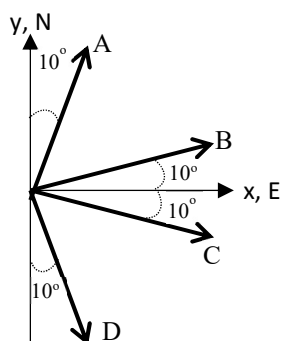
Instructions

























- 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.**
- When time is called, immediately stop writing, close your exam booklet, remain seated, and TAs will be around to pick up the exam.
- Working after time is called will be considered academic dishonesty.
- Turn your equation sheet and note card in at the end of the exam.
- You will have 75 minutes to complete the exam.

Guidelines

- **Assume 3 significant figures** for all given numbers and final results unless otherwise stated
- **Show all of your work – no work, no credit**
- Any equation used must first be written in symbolic form before substituting in values.
- Equations on provided reference sheet are the **only** equations that can be assumed true without any derivations.
- Write your final answer in the box provided

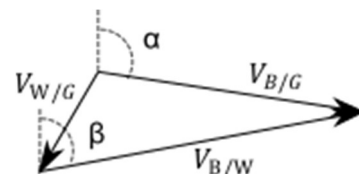
1-4 (2 pt each) Match each quantity with its correct direction. (answers can be used multiple times)



	10° N of E	10° N of W	10° E of S	10° W of S	350° CCW x-axis	80° CCW x-axis
A						
B						
C						
D						

5. (2 pt) In the vector diagram to the right, angle β is _____ angle α

Greater Than	Less Than	Equal To	Need more information to determine
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



6. (2 pt) The x-component of vector $\vec{v} = (3\hat{i} + 7\hat{j})m$ is

3	\hat{t}	7	\hat{j}
\circ	\circ	\circ	\circ

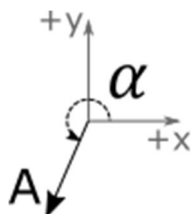
7. (2 pt) On a velocity-time graph, the slope of the line represents _____.

Position	Velocity	Acceleration	Something else
\circ	\circ	\circ	\circ

8. (2 pt) In Excel, a formula starts with

, (comma)	= (equal)	\$ (dollar sign)	((parenthesis)
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9-10 (2 pt each) What is the x-component (A_x) and the y component (A_y) of vector A?

[illegible]

11. (6 pt) The excel formula =D\$3 + D\$4*(A1 – E\$1) is entered in cell B1. If this formula were auto-filled down column B, write what the formula that would be displayed in cell B5:

=

12. (6 pt) 1 smoot = 5ft 7 in. Convert 0.8 smoot^2 to in^2

13. (5 pts) An object is launched from a height of h_0 [ft] above the ground at a speed of v_0 [ft/s] and hits the ground t_1 seconds later. What angle θ [deg from horizontal] was the object launched at? Answer as a symbolic expression.

$\theta =$

14. (8 pts) Dr. Maczka is flying from Knoxville to Minneapolis, MN which is 792 mi at a bearing of 35 degrees W of N from Knoxville. The airplane has an airspeed of 350 mph and there is a wind blowing at 20 mph 30 degrees N of E. What direction (W of N) should the plane fly? Complete only the Represent and Organize steps for this problem. Use only symbols in representation, including all angles. Organization only requires relationships between symbols and values, no equations needed.

Representation:

Organization:

15. (17 pts) McKinsie is riding her bike from the Ag campus to ZEC. Starting from rest she accelerates at a constant rate of 5.5 ft/s^2 for 3.2 seconds. She continues at a constant speed for another 3 minutes. Pulling up to ZEC she slams on her breaks (deaccelerating at a constant rate) coming to a stop in 1.1 seconds just before crashing into Dr. McCave. What was the total distance she traveled?

Representation:

Organization:

Calculations:

Answer:

16. (17 pt) Matthew and Katy start from the same location outside ZEC. Matthew walks 256 feet at a direction of 25 degrees West of North, then runs 128 feet at a direction of 32 degrees South of East, and finally skips 64 feet in the direction 10 degrees West of South. What direction (CCW from +x-axis) should Katy walk to go directly to Matthew's ending position?

Representation:

Organization:

Calculations:

Answer:

96.1° CCW from +x-axis

17. (21 pts) Dr. McCave launches a box of old EF141 exams at a speed of 1.8 m/s out her office window 10 meters from the ground. Exactly 1.387 seconds later, Mia sees it pass the Student Success office window at a height of 2 meters off the ground. How far from the building does the box land? Assume the ground is perfectly level and forms a right angle with the side of the building.

Representation:

Organization:

Calculations:

Answer:

2.26 m