

Math 120 A, B Winter 2012
Mid-Term Exam Number One
January 26, 2012

Name: _____

Student ID no. : _____

Signature: _____

Section: _____

1	10	
2	10	
3	10	
4	10	
Total	40	

- Complete all four questions.
- Show all work for full credit.
- You may use a scientific calculator during this examination. Graphing calculators are not allowed. Also, other electronic devices are not allowed, and should be turned off and put away for the duration of the exam.
- If you use a trial-and-error or guess-and-check method when an algebraic method is available, you will not receive full credit.
- You may use one hand-written 8.5 by 11 inch page of notes. Write your name on your notesheet and turn it in with your exam.
- You have 50 minutes to complete the exam.

1. Ferdinand and Molly are moving in the xy -plane. They move at constant speeds along straight lines.

Molly starts from the point $(3, 4)$ and heads directly toward the point $(-5, -2)$, reaching it in 8 seconds.

(a) Find the parametric equations describing Molly's location.

(b) Ferdinand moves half as fast as Molly does. He starts from the point $(12, 6)$ and heads directly toward the point $(5, 0)$.

Find the parametric equations describing Ferdinand's location.

2. (a) Let $g(x) = 5x - 1$. Simplify the following expression as much as possible:

$$\frac{g(x+h) - g(x)}{h}.$$

- (b) Let $f(x) = x^2 - 3x$. Simplify the expression below as much as possible.

$$\frac{f(x+2a) - f(x-a)}{a}.$$

3. Freddy is sailing near a buoy. Freddy starts from a point 3 miles EAST and 2 miles NORTH of the buoy. Freddy then sails in a straight line toward a point 4 miles due SOUTH of the buoy. When Freddy reaches the point closest to the buoy on this course, Freddy changes direction and sails due WEST for 10 miles.

Freddy sails at a constant speed of 7 miles per hour.

For what length of time is Freddy within 3 miles of the buoy?

4. Gary and Miri were camped at a site in the desert. At 6 AM, Miri bicycled north from the site at 22 km per hour. At 7:30 AM, Gary bicycled east from the site at 16 km per hour. When Miri and Gary were 100 km apart, how long had Miri been bicycling?