

Math 120 A, B Winter 2013
Mid-Term Exam Number Two
February 28, 2013

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. Robert starts walking due south from a point in the desert at 7 AM. He walks at a constant speed of 3 km/hr.

Starting at the same time, Frida starts walking from a point 5 km south and 6 km west of Robert's starting point. Frida walks along a straight line which passes through Robert's starting point. Frida walks at a constant speed to 4 km/hr.

When will Frida and Robert be closest together? Give your answer in hours after 7 AM.

2. The population of the city of Rud doubles every 35 years. The population of the city of Yum increases by 2.3% every year.

In the year 2000, Yum had a population of 12,000.

Rud had a population of 19,000 in the year 1995.

When will the population of Yum be double that of the population of Rud? Give your answer in years after 2000.

3. Let $f(x)$ be a linear-to-linear rational function. Suppose $f(1) = 2$, $f(2) = 3$ and $f(11) = 5$.

(a) Find $f(10)$.

(b) Find the fixed points of f .

4. Let $g(x) = \sqrt{x} + \sqrt{x-1}$.

(a) Suppose $f(x)$ is a function whose graph is the graph of $g(x)$ shifted 3 units to the right and 4 units down. Write the rule for $f(x)$.

(b) Find the inverse function of the function you found in part (a). You do not have to specify the domain.