

Name:

**Diagnostic quiz**

This quiz will not count towards your course grade. Some questions test material you should already know well, and others will give you some idea of what this course will cover.

You may not use a calculator. Allow an average of 2 minutes per question, although many should take you only a few seconds. Write neatly. Put your name on each sheet. Use the back of the pages for scrap work.

1. What is the sum of  $101/1001$  and  $131/847$ ?

2. What is the greatest common divisor of 2,079 and 3,696?

3. What is  $1 + 1/5 + 1/25 + 1/125 + \dots$ ?

4. Sketch a proof of your answer to the previous question.

5. If you throw 4 pennies, what is the probability of getting exactly 2 heads?

6. What is

$$\int \frac{dx}{\sqrt{1-x^2}}?$$

7. What is

$$\int_{-1}^1 \frac{dx}{\sqrt{1-x^2}} ?$$

8. What is

$$\frac{d \arcsin x}{dx} ?$$

9. What is  $\sqrt{1.002}$  rounded to 6 significant figures?

10. If you throw a pair of dice, what is the probability of seeing a total score of 5 on their tops?

11. What function  $y(x) \neq 0$  is equal to twice its own derivative?

12. Find the quotient and remainder of 100,001 divided by 1,001.

13. What is the next term in the following series?

$$1 - 2 + \frac{4}{2} - \frac{8}{6} + \frac{16}{24} - \dots$$

14. What is the exact sum of that series?

15. What is the expression for 63 in base 2?

16. What fraction has decimal expansion  $0.312312312\dots$ ?