Answer the questions in the spaces provided. If you run out of room for an answer, continue on the back of the page.

Name and section: _____

Instructor's name: _____

1. Given the equation $x^n + y^n = z^n$ for x, y, z and n positive integers.
   (a) (5 points) For what values of n is the statement in the previous question true?

   (b) (2 ½ points) For $n = 2$ there's a theorem with a special name. What's that name?

   (c) (2 ½ points (bonus)) What famous mathematician had an elegant proof for this theorem but there was not enough space in the margin to write it down?

Total for Question 1: 7½

2. Which of these famous physicists invented time?
   A. Stephen Hawking B. Albert Einstein C. Emmy Noether D. This makes no sense

3. Which of these famous physicists published a paper on Brownian Motion?
   - ◯ Stephen Hawking
   - ◯ Albert Einstein
   - ◯ Emmy Noether
   - ◯ I don't know

4. (20 points) Compute
$$\int_0^\infty \frac{\sin(x)}{x}$$

5. (30 points (bonus)) Prove that the real part of all non-trivial zeros of the function $\zeta(z)$ is $\frac{1}{2}$ (A million-dollar question)

Question:	1	2	3	4	5	Total
Points:	$7\frac{1}{2}$	0	0	20	0	$27\frac{1}{2}$
Bonus Points:	$2\frac{1}{2}$	0	0	0	30	$32\frac{1}{2}$
Score:						