

**MA 330 Homework**  
**Due Monday, Feb 16**

**Problem 1:** *Journey Through Genius* has brought us to a variety of geographic locations<sup>1</sup>. On a blank piece of paper, neatly sketch a map of the Earth. Label the following locations, all of which have played a role in our discussions so far.

- Egypt, including Alexandria (discussed throughout JTG)
- Mesopotamia (discussed in Chapter 1 of JTG)
- Greece, including Athens (discussed throughout)
- Iraq, including Baghdad (discussed on page 130 of JTG)
- Turkey (the birthplace of Thabit ibn Qorra, discussed on page 130 of JTG)
- India (source of Hindu-Arabic numerals, discussed on page 130 of JTG)
- Spain, including the city of Toledo (discussed on page 131 of JTG)
- Italy (discussed in Chapter 6 of JTG)

**Problem 2:** We have completed our reading about mathematics in the ancient world; for the rest the course we will be discussing mathematics from the past 500 years. A critical tool in modern mathematics is the use of infinite series, and infinite processes more generally. As a preview for what is to come, look at the following series:

- On page 108 of *Journey Through Genius*, Leibniz's series for  $\pi$  is discussed:

$$1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \dots = \frac{\pi}{4}$$

- On page 196 of *Journey Through Genius*, the harmonic series is discussed:

$$1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \dots = \infty$$

- On page 215 of *Journey Through Genius*, the following is discussed:

$$1 + \frac{1}{4} + \frac{1}{9} + \frac{1}{16} + \frac{1}{25} + \dots = \frac{\pi^2}{6}$$

Of these series, which do you find most interesting and why? How do you feel about infinite series in general?

NOTE: Problem 2 should be: typed, 1 page long, double spaced, 12 point Times New Roman font.

NOTES

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The following is an excerpt from a National Geographic press release from May 2, 2006; for the full report, go to <http://www.nationalgeographic.com/roper2006/>.

Despite the barrage of news coverage about the Iraq war since it began in 2003, six in 10 young Americans ages 18 to 24 cannot find Iraq on a map of the Middle East, according to a new National Geographic-Roper Public Affairs 2006 Geographic Literacy Study. Two-thirds do not know that the catastrophic October 2005 earthquake that killed 70,000 people struck in Pakistan. More than four in 10 can't even place Pakistan in Asia.

According to the survey, conducted in December 2005/January 2006, young Americans are alarmingly ignorant of the relationships between places that give context to world events. Seventy-four percent believe English is the primary language spoken by the most people in the world; it is Mandarin Chinese. Seventy-one percent don't know that the United States is the largest exporter of goods and services; nearly half

(48 percent) think it is China. And while China's population is actually four times the size of the U.S. population, 45 percent of young Americans think it's only twice as large. Though outsourcing of jobs to India has been a major business news story, almost half the respondents (47 percent) were not able to find that country on a map of Asia.

Respondents also demonstrated poor understanding of global hotspots. Seventy-five percent couldn't locate Israel on a map of the Middle East, despite the fact that the conflict between Israelis and Palestinians has been ongoing throughout these young people's lives. Seven in 10 couldn't find North Korea on a map of Asia, and six in 10 did not know its border with South Korea is the most heavily fortified in the world. Thirty percent thought the most heavily fortified was the U.S.-Mexican border.