The following problems have appeared on my tests over the years, typically worth 1/2 or 1 point. They are always "extra," in the sense that their score is not counted in the nominal point value of the test. They constitute my response to that bane of all professors: the question "what will be on the test?," and allow me to answer honestly with "You are responsible for the sum total of human knowledge since the beginning of recorded history with particular emphasis on the contents of this course."

1. [Fall 1984] What is the source of the line "This particularly rapid, unintelligible patter isn't generally heard and if it is it doesn't matter."?

2. [Fall 1984] Why are manhole covers round?

3. [Fall 1989] Certain Soviet experts employ a unit they call the "McNamara". What is it?

4. [Fall 1989] Name four languages (not programming languages) spoken in Europe that are not Indo-European.

5. [Fall 1989] What is the common name of the following theorem? "Let $m_1, \cdots, m_r$ denote r positive integers that are relatively prime in pairs, and let $a_1, \cdots, a_r$ denote any r integers. Then the congruences $x \equiv a_i \pmod{m_i}$, $i = 1, \cdots, r$ have common solutions, any two of which are congruent modulo $m_1 m_2 \cdots m_r$."

6. [Fall 1991] Demonstrate by counterexample that it is not generally the case that an intersection of open sets is open.

7. [Fall 1991] Identify the famous literary character whose partially abbreviated name is Thomas S. Scott H.

8. [Fall 1991] Name a 19th century mathematician who devised a method for solving systems of linear equations with integer coefficients.

9. [Fall 1992] Identify the author of the following line.

A bunch of the boys were whooping it up in the
  Malamute Saloon;
  . . .

11.   [Fall 1995] A certain medical diagnostic test gives the correct result (positive or negative) 99% of the time. The disease it tests for infects 1% of the population. You are selected at random to undergo this test, and it yields a positive result (i.e., indicating you have the disease). What is the probability that you actually have the disease?

12.   [Fall 1995] According to at least one 19th-century writer, under what circumstances is one likely to softly and silently vanish away, and never be heard from again?

13.   [Fall 1995] What happened in Paris on 5 October 1582?

14.   [Fall 1995] What is the conventional name for the assertion that if Λ is an arbitrary index set and $\mathcal{A} = \{A_\iota | \iota \in \Lambda\}$ is an indexed collection of non-empty sets, then there is a set $C = \{c_\iota | \iota \in \Lambda\}$ such that $c_\iota \in A_\iota$ for all $\iota \in \Lambda$?

15.   [Fall 1996] If all the ice covering the Arctic Ocean were to melt, roughly how much would sea level rise?

16.   [Fall 1996]

   Strephon's a member of Parliament.
   Which party does he represent?

17.   [Fall 1997] If q is analytic everywhere within and on a closed contour ∂ in the complex plane and κ is interior to ∂, then what is

$$\frac{1}{2\pi i} \int_\partial \frac{q(\gamma)}{\gamma - \kappa} d\gamma?$$

18.   [Fall 1997] What fictional character claims to be

   "...a dealer in magic and spells
      In blessings and curses
      And ever-filled purses
   In prophecies, witches, and knells?"

```
int *p                              /* Pointer */  ;
int x,y                             /* Simple integers */ ;
p = &x                              /* Local alias */ ;
x = 4                               /* Initialize x */ ;
y = 12                              /* Initialze y */ ;
x = y/*p                            /* Compute quotient */ ;
(void) printf("%d\n", x)            /* Result */ ;
```

20. [Fall 1998] What is the maximum number of spheres of radius r that may simultaneously be tangent to a fixed sphere of radius r without overlapping?

21. [Fall 1999] What famous woman co-authored a patent for a "Secret Communication System" that disguised transmissions by having the transmitter and receiver "hop" together among frequencies unpredictably?

22. [Fall 1999] What order contains a quarter of all known animal species?

23. [Fall 1999] Why did the fellow being roused in the following verse faint away in the first place?

> They roused him with muffins – they roused him with ice
>
> –
>
> They roused him with mustard and cress –
> They roused him with jam and judicious advice –
> They set him conundrums to guess.

24. [Fall 2000] Name a poet much of whose work can be sung to the tune of *The Yellow Rose of Texas.*

25. [Fall 2000] Who was the main advocate of the idea that falsifiability distinguishes science from non-science?

26. [Fall 2001] On an exceptionally clear day near the end of March, you are flying slowly due north at very low altitude. Directly ahead of you, you see the limb of the sun briefly rise slighly above the horizon for half an hour before setting again. As it sets, your GNU/Linux laptop tells you that the time is 1330 UTC. Where are you? Be as precise as possible.

28. [Fall 2002] What is $\lim_{n \to \infty}(1 + \frac{2}{n})^n$?

29. [Fall 2004] What is

$$\cfrac{1}{1 + \cfrac{1}{1 + \cfrac{1}{1 + \cdots}}}?$$

30. [Fall 2004] In what city would you most likely have found the author of the following quotation?

> "If we take in our hand any volume of divinity or school metaphysics, for instance, let us ask, Does it contain any abstract reasoning concerning quantity or number? No. Does it contain any experimental reasoning concerning matter of fact and existence? No. Commit it then to the flames, for it can contain nothing but sophistry and illusion."

31. [Fall 2006] Where can you expect to find the highest concentration of janjaweed?

32. [Fall 2006] At aphelion, a certain planet is 4×10^8 kilometers from its sun, and traveling at 50 km/sec. Its orbit is rather eccentric—at perihelion it is at 10^8 kilometers from its sun. How fast is it traveling then?

33. [Fall 2006] Where is Olympus Mons (the place that is, not the blogger)?

34. [Fall 2006] Where or what is Sark?

35. [Fall 2007] In what state was the first 911 call made?

36. [Fall 2007] What is an example of preadaptation?

37. [Fall 2008] I was walking one evening some time ago about an hour after sunset, and saw a fairly bright planet (magnitude < 0.5) near the eastern horizon. Which planet(s) could it have been?

38. [Fall 2008] If I could see a certain object from the center of the earth at sunset this evening, it would appear to be moving at about 2300 mph and accelerating at roughly right angles to its path at about 0.009 ft/sec^2. What is it?

"In an age of imitation, I can claim no special merit for this slight attempt at doing what is known to be so easy. Any fairly practised writer, with the slightest ear for rhythm, could compose, for hours together, in the easy running metre of 'The Song of Hiawatha.' Having, then, distinctly stated that I challenge no attention in the following little poem to its merely verbal jingle, I must beg the candid reader to confine his criticism to its treatment of the subject." [from Lewis Carroll, *Selected Poems,* Keith Silver, ed., Carcanet Press Limited, 1995.]

This preface seems kind of pointless to me. Why do you suppose he wrote it?

40.   [Fall 2008] Where would one normally expect to find the following literary gem?

"It wasn't the best of times; it wasn't the worst of times; it was the times you'd get if you arranged all possible times (including even fictional times in which the nights were usually dark and stormy) in order from worst to best on the real number line from 0.0 inclusive to 1.0 exclusive and then used a really good uniform random number generator to pick a value in that range thus choosing the corresponding times—that's the times it was."

41.   [Fall 2009] What kind of journey are we undertaking whan that Apryll, wyth hys shouris sote, the droughte of Marche hath percyd the rote?

42.   [Spring 1986] Approximately how many prime numbers are there less than 10^{12}?

43.   [Spring 1986] Name a vitamin that contains cobalt.

44.   [Spring 1986] Who composed *I'm Just Wild About Harry?*

45.   [Spring 1986] Why are plumbers called plumbers?

46.   [Spring 1990] Roughly in the direction of which constellation is the center of our galaxy?

47.   [Spring 1990] What number bases did the ancient Babylonians use?

48.   [Spring 1995] According to one 18th-century writer, where do we find "no vestige of a beginning,—no prospect of an end?"

50.   [Spring 1996] Who abjured "this rough magic?"

51.   [Spring 1997] If a and m are relatively prime, and $\phi(m)$ denotes the number of positive integers less than and relatively prime to m, what is $a^{\phi(m)}$ mod m?

52.   [Spring 1997] Two decades ago, what would a Congolese citizen have been called?

53.   [Spring 1997] Who wrote that "The child is father of the man"?

54.   [Spring 1998] Somewhere, it is written

"Fair youth, beneath the trees, thou canst not leave
Thy song, nor ever can those trees be bare;"

Why not?

55.   [Spring 1998] What ship captured the H.M.S. *Java*?

56.   [Spring 1998] Where does one find a *fenestra ovalis?*

57.   [Spring 1999] Where do the poppies blow between the crosses, row on row?

58.   [Spring 1999] Who was Doroteo Aranga?

59.   [Spring 2005] Where, according to the poet, did one find "a miracle of rare device"?

60.   [Spring 2005] Which of the following does not belong?

Aeolian, Corinthian, Dorian, Ionian, Locrian, Lydian, Mixolydian, Phrygian.

61.   [Spring 2008] If the intersection of a set, $\mathcal{S}$, of open sets is not open, what can you say about $\mathcal{S}$?

62.   [Spring 2008] I noticed that a certain kind of prepackaged snack sold in our local coffee shops has the slogan "The ones you remember," which I thought was mildly clever. Why?

64. [Spring 2009] It is a theorem that in first-order logic any valid statement must be satisfiable in some countable or (if we assume the usual definition of equality) finite domain. Yet in first-order axiomatic set theory, one can prove the existence of uncountable sets. What is the name usually given to this curious fact?

65. [Spring 2009] Name a poem in which old trees in a forest are compared with ancient Celtic priests.

66. [Spring 2009] What ancient construction problem did Pierre Wantzel prove to be impossible?

67. [Fall 1984] State the ungeneralized (or, if you prefer, the generalized) ham sandwich theorem.

68. [Fall 1984] What musical work contains a song that begins "Morgenlich leuchtend im rosigen Schein...." ("Morning shone with rosy light")?

69. [Spring 1993] Name an animal whose Linnaean name is identical to its common name (at least in English-speaking countries).