

# ***FACULTY NOTES***

The LTAs and Spinoffs are designed so that each professor can implement them in a way that is consistent with his/her teaching style and course objectives. This may range from using the materials as out-of-class projects with minimal in-class guidance to doing most of the work in class. The LTAs and Spinoffs are amenable to small group cooperative work and typically benefit from the use of some learning technology. Since the objective of the LTAs and Spinoffs is to support the specific academic goals you have set for your students, the Faculty Notes are not intended to be prescriptive. The purpose of the Faculty Notes is to provide information that assists you to take full advantage of the LTAs and Spinoffs. This includes suggestions for instruction as well as answers for the exercises.



## FACULTY NOTES

### SPINOFF 5A

#### Functional Risk Assessment

#### Answers

- 1) Cancer Risk = (Chemical Concentration)  $\times$  (Carcinogenic Intake Factor)  $\times$  (Slope Factor)
- 2)  $C_1(x) = x(3.495E - 07)(4.3E + 00) = (1.503E - 06)x$
- 3)  $C_2(x) = \frac{x(5.312E - 02)(8.4E + 00)}{9.66E + 08} = (4.619E - 10)x$
- 4)  $C_3(x) = (1.503E - 06)x + (4.619E - 10)x = (1.5035E - 06)x$
- 5) There are many answers possible here. However students should realize that the lowest value for both the domain and range of each function is 0. Since values for the range measure Cancer Risk, they should be very small. Reasonable upper bounds for the range are  $10^{-4}$  or  $10^{-3}$ . Encourage students to experiment with their graphing utility to come up with reasonable domain and range values.
- 6) Once again many answers are possible. Students should use the values determined in Question 5 for their graphs. Experimentation with a graphing utility might also help students develop a reasonable graph.
- 7) The percentage of Cancer Risk due to ingestion of soil is 99.97% while the percentage of Cancer Risk due to breathing airborne soil is only 0.03%.
- 8) A concentration of beryllium of 0.665 mg/kg or greater will yield an unacceptable Cancer Risk at the  $10^{-6}$  level.
- 9) A concentration of beryllium of 66.511 mg/kg or greater will yield an unacceptable Cancer Risk at the  $10^{-4}$  level.