

POLYNOMIALS

PROBLEM 3: ALCOHOL CONCENTRATION

The polynomial function $a(x) = -0.0915x^3 + 1.771x$ gives the approximate alcohol concentration in hundredths of a percent in an average person's bloodstream x hours after one drink.

- A. After how many hours is the alcohol concentration the greatest? What is the maximum alcohol concentration?
- B. How long does it take for the alcohol level to return to 0?
- C. In some states, a person is legally intoxicated if the blood alcohol level exceeds 0.08%. How long would it take an average person to be considered legally drunk after consuming one alcoholic drink?

PROBLEM 4: AUTOMOBILE EMISSIONS

The number of parts per million of nitric oxide emissions from a particular car engine is approximated by the model $y = -5.05x^3 + 3857x - 38,411.25$, for $13 \leq x \leq 18$, where x is the air-fuel ratio.

- A. What is the maximum nitric oxide emission for this car engine?
- B. What air fuel ratio produces an emission of 2000 parts per million?
- C. Why do you suppose there are two ratios that produce the same amount of emissions?

REFERENCES:

Algebra in a Technological World, NCTM Addenda Series, 1995.

Precalculus, Third Edition, Larson, Hostetler, D.C. Heath and Company, 1993.

Secondary Math, An Integrated Approach, Focus on Advanced Algebra Addison-Wesley Publishing Company, 1996.