University of Guyana
Faculty of Technology

EMT 112
Test I

September 23, 2010

Directions: Answer all questions. Show all working.

1. Evaluate or simplify. (a) $\sqrt{1250}$ (b) $\frac{1}{2\sqrt{3}+\sqrt{2}}$ (c) $\frac{12x^3y^{-6}z}{4xy^{-8}z^{-2}}$ (d) $\sum_{i=1}^{5} 2i$

2. Solve for x: (a) $3^{x-1} = 9$ (b) $\log_2 x + \log_2(x-2) = 3$ (c) $3^{x-1} = 7$

3. A wooden artifact from an ancient tomb contains 25% of the carbon-14 that is present in living trees. How long ago was the artifact made? (the half-life of carbon-14 is 5730 years)

4. If one earthquake is 100 times more intense than another, how much larger is its magnitude on the Richter scale? (use $M = \log \frac{I}{S}$)

5. What is the largest rectangular area that a fencing of 600 ft can enclose?

6. A student makes and sells necklaces at a booth during Amerindian Month. The material for each necklace costs her $600 and she has been selling about 20 per day at $1000 each. She has been wondering whether or not to raise the price, so she takes a survey and finds that for every $100 increase she would lose only one sale a day. What price should she set for the necklaces to maximize her profit?

7. An auditorium has 40 seats in the first row, 42 seats in the second row, 44 seats in the third row, and so on. If there are twenty rows in the auditorium, how many seats are there in the auditorium?

8. A ball is dropped from a height of 10 feet and bounces. Each bounce is 1/2 of the height of the previous bounce. Find the total distance the ball travels before coming to rest.

9. Canola oil is 7% saturated fat, and corn oil is 14% saturated fat. Crisco sells a blend, Crisco Canola and Corn Oil, which is 11% saturated fat. How many gallons of each type of oil must be mixed to get 280 gallons of this blend?

10. Two hundred people were on a charter flight to Barbados. Some paid $20,000 for their tickets and some paid $24,000. If the total revenue for the flight was $4.2M then how many tickets of each type were sold?