

University of Guyana
Faculty of Technology

EMT 111
Test I(Practice)

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) $\frac{12x^3y^{-6}z}{4xy^{-8}z^{-2}}$
2. Solve for x: (a) $3^{x-1} = 9$ (b) $\log_2 x + \log_2(x-2) = 3$ (c) $3^{x-1} = 7$
3. Solve for x: (a) $(3x+2)(x-3) \leq 0$ (b) $\frac{3x+9}{x^2+2x+1} \geq 1$ (c) $|x+2| < |3x-3|$
4. 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)
5. If one earthquake is 100 times more intense than another, how much larger is its magnitude on the Richter scale? (use $M = \log \frac{I}{S}$)
6. What is the largest rectangular area that a fencing of 600 ft can enclose?
7. 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?
8. 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?
9. 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?

Answers:

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|---|---|--|--|
| 1 | (a) $25\sqrt{2}$ | (b) $\frac{2\sqrt{3}-\sqrt{2}}{10}$ | (c) $3x^2y^2z^3$ |
| 2 | (a) $x = 3$ | (b) $x = 4$ | (c) $x = 1 + \log_3 7$ |
| 3 | (a) $[-2/3, 3]$ | (b) $[\frac{1-\sqrt{33}}{2}, -1) \cup (-1, \frac{1+\sqrt{33}}{2}]$ | (c) $(-\infty, \frac{1}{4}) \cup (\frac{5}{2}, +\infty)$ |
| 4 | 11,460 years | | |
| 5 | 2 | | |
| 6 | 22,500 sqft | | |
| 7 | Will be on the actual test | | |
| 8 | 120,160 | | |
| 9 | 150-\$20,000 tickets and 50-\$24000 tickets | | |