

**Math 1314 ONLINE**  
**POPPER 10**

Enter your answers in the EMCF titled Popper 10 before Wednesday, March 27, 2013, at 11:59 p.m.

**POPPER 10, question 1:**

Suppose  $f(x) = \frac{1}{3}x^3 - 5x^2 - 12x + 3$ . Find the critical numbers.

- A. -1.0828, 11.0828      B. -2.3058, 0.2286      C. -2.3058, 0.2286, 17.0772  
D. -11.0828, 1.0828      E. -0.2286, 2.3058

**POPPER 10, question 2:**

Suppose  $f''(a) = 2.5$ , where  $a$  is a critical number. What does this tell you about the graph of the function when  $x = a$ ?

- A. The function has a relative maximum when  $x = a$ .  
B. The function has a relative minimum when  $x = a$ .  
C. This information does not given enough information to tell us anything about the graph of the function when  $x = a$ .

**POPPER 10, question 3:**

The number of deer in a game preserve can be given by the function

$N(t) = -0.025t^3 + 1.285t^2 - 3.278t + 12$  where  $t$  is given in months since the population was first counted and  $N(t)$  gives the number of deer. What is the maximum number of deer that are in the game preserve?

- A. 10      B. 33      C. 405      D. 49

**POPPER 10, question 4:**

You want to construct an open top box by cutting equal squares from the corners of a rectangular-shaped piece of cardboard and then folding up and securing the resulting flaps. The cardboard measures 8 inches by 7 inches. Suppose  $x$  is the length of one side of the square that you will cut off of the corners. You want the box to have the maximum volume. Which of these gives the formula for the box with these requirements?

A.  $f(x) = x(8-x)(7-x)$

B.  $f(x) = x(8-2x)(7-2x)$

C.  $f(x) = 2x(8-x)(7-x)$

D.  $f(x) = (8-2x)(7-2x)$

**POPPER 10, question 5:**

Find the value of  $x$  that will maximize the volume of the box.

A. 1.24

B. 3.76

C. 1.24 or 3.76

D. 4.52