

# Student Mathematics League

## Questions for Week of Oct. 15

Student Name: \_\_\_\_\_ Math Instructor: \_\_\_\_\_

CWID#: \_\_\_\_\_ Phone #: \_\_\_\_\_

Submit your entries to Bobby Jackson in Alexander 210. **Deadline for submissions is 1 p.m.**

**Friday, October 19.** One randomly selected student from the highest scoring submissions will receive a cash prize of \$25. Score will be determined as follows:

- +2 points for each correct response
- 1/2 point for each incorrect response
- 0 points for no response

Clearly circle your answer in each case.

1. What would be the approximate dollar value of a straight trail of pennies from Borough of Manhattan C C in New York to Pasadena City College in California, where each penny is horizontal and tangent to the previous penny in the trail?

A. \$200,000    B. \$2,000,000    C. \$20,000,000    D. \$200,000,000    E. \$2,000,000,000

2. The mean of four numbers is 107, the median is 83, and the mode is 51. Find the range.

A. 160                      B. 184                      C. 187                      D. 211                      E. 262

3. If  $f$  is a linear function such that  $f(3) = 0$  and  $f(10) \neq 0$ , find  $\frac{f(-2) + f(0) + f(8)}{f(1) + f(5) + f(6)}$

A. -1                      B. 0                      C.  $\frac{1}{2}$                       D. 1                      E. 3

4. Let  $f(x) = \begin{cases} 22 - 3^x & \text{if } x \geq 3 \\ -\frac{5}{3}x & \text{if } -3 < x < 3 \\ 2^{-x} - 3 & \text{if } x \leq -3 \end{cases}$ . Find  $f^{-1}(10)$ .

A. -6.5                      B.  $-\ln(6.5)$                       C.  $\log_3 12$                       D. -6                      E.  $-\log_2 13$

5.  $ABCD$  is a quadrilateral with  $AD = 10$ ,  $CD = 10$ ,  $\angle A = 118^\circ$ ,  $\angle B = 22^\circ$ , and  $\angle C = 130^\circ$ . Find  $BC$  accurate to three significant figures.

A. 18.8                      B. 21.8                      C. 23.4                      D. 25.9                      E. 36.1