

**SOLUTIONS TO 12/09/09 POW**

Write down each of the following:

1. The Law of Cosines Formula

$$c^2 = a^2 + b^2 - 2ab \cos \gamma$$

2. The Law of Sines Formula

$$\frac{\sin \alpha}{a} = \frac{\sin \beta}{b} = \frac{\sin \gamma}{c}$$

3. The Product Rule for finding a derivative

$$f'(x) = F'S + S'F$$

4. The Quotient Rule for finding a derivative

$$f'(x) = \frac{N'D - D'N}{D^2}$$

5. The cross product of two vectors.

$$\begin{vmatrix} i & j & k \\ a & b & c \\ d & e & f \end{vmatrix}$$

For problems 6, 7, 8,  $u = ai + bj + ck$  and  $v = di + ej + fk$

6,7. The dot product of two vectors (both formulas)

$$u \cdot v = |u||v| \cos \theta$$
$$u \cdot v = ad + be + cf$$

8. The sum of an infinite geometric series whose common ratio is a proper fraction.

$$S = \frac{a_1}{1-r}$$

9. The limit definition of the first derivative.

$$\lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$

10. Given  $h(x) = f(g(x))$ , find  $h'(x)$ .

$$h'(x) = f'(g(x))g'(x)$$

## PROBLEM OF THE WEEK DUE 12/16/09

And, finally, here come 5 challenging multiple choice questions for this week. Each problem is worth 2 points.

Circle your final answers.

Solutions to this week's POW will be posted on the website over break. Good luck on the semester exam.

1. In what room does you Pre-Calculus class take place?

- A. The Main Office
- B. The Gymnasium
- C. Room 1423
- D. Room 246
- E. The PPS Office

2. If  $f(x) = x^2$ , what is  $f'(x)$ ?

- A.  $2x$
- B.  $71.3x$
- C.  $2$
- D.  $x$
- E.  $\frac{1}{3}x^3 + C$

3. If  $v(t) = 2t - 3$ , what is  $v(4)$ ?

- A. 4
- B. 2
- C. -3
- D. 5
- E.  $\pi$

4. In what class would you find the study of permutations and combinations?

- A. History
- B. Physical Education
- C. Pre-Calculus
- D. History of American Film
- E. English

5. How many questions are on the semester exam?

- A. 1.283
- B. 71.3
- C. 55
- D. 89.717
- E. 14237.94