Would you like to receive feedback from our execs? (marking your solutions, giving corrections, etc.)
Yes/No: _____

Multiple Choice

Highlight the correct answer for each question.

1. The expression $\sqrt{5^2 - 4^2}$ is equal to?

(A) 1 (B) 2 (C) 5 (D) 3 (E) 9

2. If *p* is an odd integer and *q* is an even integer, which one of the following is an odd integer?

(A) 2p + 3q (B) 2p (C) p^2 + 2q (D) p * q (E) 2(p + 3q)

3. The difference between the square of two consecutive integers is 1401. The sum of the squares of these two consecutive integers is?

(A) 19801 (B) 981401 (C) 1962801 (D) 978601 E) 1401

4. The addition of $1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \ldots \frac{1}{2^{\infty}}$ is approximately equal to?

(A) ∞ (B) 1 (C) 2e (D) 2 (E) e^e

5. Eight teams compete in a tournament. Each pair of teams plays exactly one game against each other. There are no ties. If the two possible outcomes of each game are equally likely, what is the probability that every team loses at least one game and wins at least one game?

(A) $\frac{1799}{2048}$ (B) $\frac{903}{2048}$ (C) $\frac{1793}{2048}$ (D) $\frac{902}{2048}$ (E) $\frac{1831}{2048}$

Word Problems

Either type your solutions or insert images of handwritten solutions. Be sure to show your work!

1. There are three distinct real numbers *a*, *b* and *c* that are solutions of the equation $x^3 - 4x = 0$. What is the value of the product *abc*?

2. There are 12 different four-digit positive integers that can be made by arranging the digits 1, 2, 7, 7. These integers are listed from smallest to largest. What is the sum of the 7th and 8th integers in the list?

3. The terms of an arithmetic sequence add to 715. The first term of the sequence is increased by 1, the second term is increased by 3, the third term is increased by 5, and in general, the kth term is increased by the kth odd positive integer. The terms of the new sequence add to 836. Find the sum of the first, last, and middle terms of the original sequence.

Challenge for the true ~~coding~~ calculus boss (Optional)

Evaluate $\int \sqrt{\tan(x)}\, dx$. Show all steps.

Survey

Your responses will not affect your likelihood of being counted for attendance. This is simply to let our execs know how we can improve. :)

1. Approximately how much time did you spend on this problem set?

(A) Less than 15 mins
(B) 15 mins to 30 mins
(C) 30 mins to 1 hour
(D) 1 to 2 hours
(E) Over 2 hours

2. How difficult did you find this problem set?

(A) Too easy
(B) Fairly easy
(C) Neutral
(D) Fairly difficult
(E) Too difficult

Thank you for your feedback!