

Math Bowl Round 8

Problem 1: Evaluate: $11^2 + 33^2$

Ans: 1210

Problem 2: If $f(x) = x^2 + 1$ and $g(x) = 2x - 4$, what is $f(g(0)) - g(f(0))$?

Ans: 19

Problem 3: What is the cross product of the vectors a and b if $a = \langle 1, 2, 3 \rangle$ and $b = \langle 2, -3, 1 \rangle$?

Ans: $\langle 11, 5, -7 \rangle$

Problem 4: What are the first four terms of the infinite series equal to $1/(1+3x)$?

Ans: $1 - 3x + 9x^2 - 27x^3$

Problem 5: What is 1331 base 5 as represented in base 10?

Ans: 216

Problem 6: What is the angle between vector c and d if $c = \langle 1, 0, 0 \rangle$ and $d = \langle 0, 1, 0 \rangle$?

Ans 90 degrees or $\pi/2$ radians

Problem 7: What is the sum of interior angles of a polygon with 20 sides in degrees?

Ans: 3240

Problem 8: The function $f(x) = (x^2 - 3x + 2)/(x^2 - 7x + 10)$ (read as quantity $x^2 - 3x + 2$ close quantity over the quantity $x^2 - 7x + 10$ close quantity) has a removable discontinuity at what value of x ?

Ans: 2

Problem 9: A Train leaves Knoxville, TN on a 300 mile trip to Memphis, TN at 3:00 PM local time. Assuming it travels at a average speed of 60 miles per hour, what local Memphis time will the train arrive in Memphis?

Ans: 7:00 PM

Problem 10: What is the integral from 1 to infinity of $12/(1+x^2)$?

Ans: 3π

Tiebreaker 1: What is the sum of the first 10 squares?

Ans: 385

Tiebreaker 2: Given that the probability of a T-Rex fossil being discovered as male is 40 percent, what is the probability that for 3 different T-Rex fossils at least one is male?

Ans: 78.4 percent