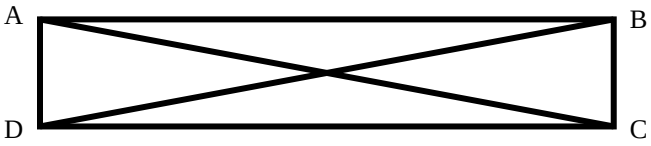
1. Find (the principal value of) : $\sin^{-1}(\sin 10)$ (10 radians, not degrees)

2. What is the highest power of 5 that divides 2011! ?

3. How many real solutions are there to the equation $\sqrt{x}-1=\sqrt[4]{x}$?

4. *True or False* ? (circle one) No path that begins and ends at A traverses each segment exactly once. (The two diagonals each count as one segment; ignore their point of intersection.)



5. Use digits *a*, *b*, and *c* to form a three-digit number *abc*. How many such numbers between 100 and 200 are prime and have the property that *ab*, *ac*, and *bc* (each considered as two-digit numbers) are themselves all prime?

6. Which of the following Greek mathematicians was known as "Beta"? (circle one)
   A. Archimedes B. Eratosthenes C. Euclid D.Pythagoras

7. Put the following events in order from the least likely to the most likely (use the indicated letters):
   E: Tossing six fair coins and getting exactly three heads
   F: Rolling two fair six-sided dice and getting a sum of 6 or 7
   G: Choosing a letter from the English alphabet (26 letters) at random and getting a letter that either immediately precedes or immediately follows a vowel. (Here we are not counting Y as a vowel and we assume that the alphabet ends at Z—it doesn't wrap back to A.)

8. How many non-real solutions are there to the equation $12x^8-3x^4-15=0$?

9. A unit cube (each side has length 1) is inscribed in a sphere. What is the surface area of the sphere?

10. How many positive numbers x satisfy the equation ? $x^{x-1}=10$?

Thank you for participating.