1. What is the tens digit (the digit second from the right) of 11^{2009}?   9

2. What is the radius of the circle with equation $x^2 - 4x = 1 - y^2 - 6y$? $\sqrt{14}$

3. How many vertices does a regular icosahedron have?   12

4. $\cos\left(2\sin^{-1}\dfrac{1}{5}\right) =$ $\dfrac{23}{25}$

5. Put the following mathematicians in order according to their year of birth, starting with the first born: Galois, Gauss, Hilbert, Newton.   Newton, Gauss, Galois, Hilbert

6. Find a fourth-degree polynomial with real coefficients that has i and $2-i$ as roots. (Do not leave your answer in factored form.)

   (many answers possible, one is $x^4 - 4x^3 + 6x^2 - 4x + 5$)

7. A triangle, M, is formed from $\triangle$ABC by constructing segments that connect the midpoints of the three sides. What is the ratio of the area of M to the area of $\triangle$ABC?   1/4

8. How many odd numbers are in the 17th row of Pascal's triangle (where the 0th row is **1** and the 1st row is **1 1**)?   4

9. A Pythagorean triple (a, b, c) consists of three positive integers such that $a^2 + b^2 = c^2$. Write all Pythagorean triples that contain the number 37. (Consider triples in which a and b are interchanged to be equal, that is (3, 4, 5) and (4, 3, 5) are regarded as one triple.)

   (12,35,37), (37,684,685)

10. A googol (in base ten) is 1 followed by one hundred zeros. Within ten, how many digits are there in a googol written in base five?   Accept anything between 134 and 154

Thank you for participating.