(20 points) Identify the following curve after one clue for 20 points, after two clues for 10 points.
1. Its equation in rectangular coordinates is y equals a over two times the quantity e to the (x over a) plus e to the (minus x over a).
2. It is the plane curve in which a uniform flexible cables hangs when suspended from two points.
    Answer: catenary

(20 points) Pencil and paper ready. Your basic calculus skills will come in handy on this bonus. For 20 points, what is the area located between the y-axis, the x-axis, the line x equals two, and the curve y equals x to the fourth.
    Answer: 32/5, thirty two fifths or 6.4

(20 points) It is an epicycloid of one loop and a special case of the limacon (limason) and is a plane curve in which the locus of a fixed point on a given circle rolls on an equal but fixed circle. For 20 points, what is this curve whose equation is given in polar coordinates by r equals a minus a cosine theta.
    Answer: cardiod

Answer the following questions about numbers for the stated number of points.
1. 5 points. What is the least common multiple of 20 and 24?
    Answer: 120
2. 10 points all or nothing. Give the three distinct prime factors of 180.
    Answer: 2, 3, 5
3. 5 points: What is the mean of 2,3,4,7, and 9
    Answer: 5