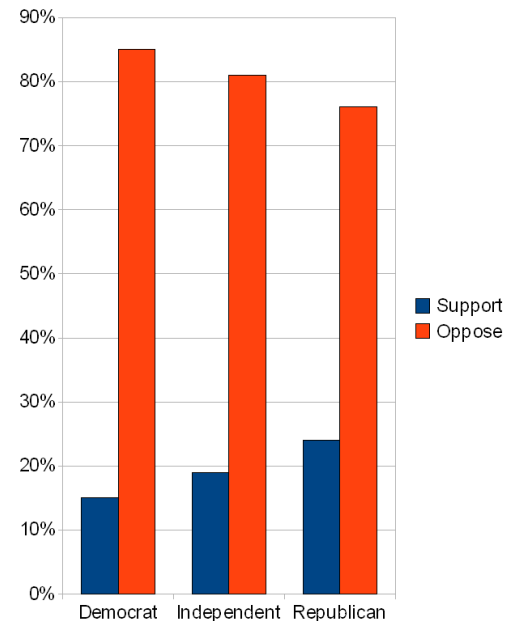# Problems of the Month
February 2020

General Problem:

In 2010 the Supreme Court ruling *Citizens United* ruled that corporations can spend money to exert influence on public elections, as the expenditure of money was deemed free speech. A poll of Americans (shown to the right) shows that 85% of Democrats, 81% of independents, and 75% of Republicans oppose this ruling. Assume that the country is 49% Democrat, 44% Republicans, and 7% Independent. What percentage of the American population oppose the Citizens United ruling?

Calculus Problem:

Find the integral below, and express the answer in summation notation.

$$\int x^{2020} e^{3x} dx$$

Challenge Problem:

What is the minimum number of colors needed in order to color every face, edge, and vertex of an octahedron (an 8-sided die) so that (i) each face has a different color from its side and corners as well as from each adjacent face and (ii) each edge has a different color from its endpoints as well as from every adjacent edge?
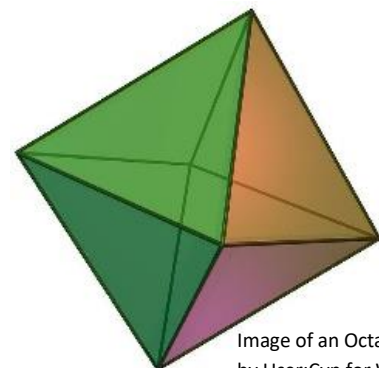

Image of an Octahedron made by User:Cyp for Wikipedia