



Problem of the Week

Problem E

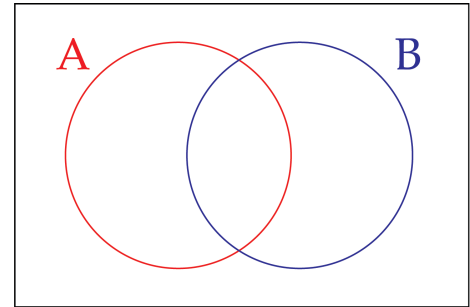
Everything in its Place 3

- (a) A Venn diagram has two circles, labelled A and B. Each circle contains functions, $f(x)$, that satisfy the following criteria.

$$A: f(2) = -3$$

$$B: f(-2) = -1$$

The overlapping region in the middle contains functions that are in both A and B, and the region outside both circles contains functions that are neither in A nor B.



In total this Venn diagram has four regions. Place functions in as many of the regions as you can. Is it possible to find a function for each region?

- (b) A Venn diagram has three circles, labelled A, B, and C. Each circle contains ordered pairs, (x, y) , where x and y are real numbers, that satisfy the following criteria.

$$A: y = (x + 3)^3 + 2$$

$$B: y = \frac{1}{2}x^2 + 1$$

$$C: y = |x + 1|$$

In total this Venn diagram has eight regions. Place ordered pairs in as many of the regions as you can. Is it possible to find an ordered pair for each region?

