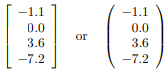
**Vectors**

A vector is an ordered finite list of numbers. Vectors are usually written as vertical arrays, surrounded by square or curved brackets, as in



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الرسمتين اللي فوق بمثلوا شكل الvector لما نرسمه, و في طريقة اسهل لكتابته اللي هي بالسطر اللي تحت (و هي اللي رح نستخدمها)

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They can also be written as numbers separated by commas and surrounded by parentheses. In this notation style, the vector above is written as (−1.1, 0.0, 3.6, −7.2).

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The elements (or entries, coefficients, components) of a vector are the values in the array. The size (also called dimension or length) of the vector is the number of elements it contains. The vector above, for example, has size four; its third entry is 3.6. A vector of size n is called an n-vector. A 1-vector is considered to be the same as a number, i.e., we do not distinguish between the 1-vector [ 1.3 ] and the number 1.3.

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المصطلحات هاي كثير مهمة و رح نستخدمها كثير بالمادة (المسطلحات باللون الأزرق)

size (also called dimension or length) بتمثل عدد الأرقام الموجودة بهذا الvector

elements (or entries, coefficients, components) بتمثل الأرقام نفسها اللي بالvector

بهاي المصطلحات ممكن نعبر عن vector من حجم n بانه n-vector و بحالة انه حجمه 1 )يعني 1-vector ) منحكي انه رقم عادي مش vector

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We often use symbols to denote vectors. If we denote an n-vector using the symbol a, the ith element of the vector a is denoted ai , where the subscript i is an integer index that runs from 1 to n, the size of the vector.

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Two vectors a and b are equal, which we denote a = b, if they have the same size, and each of the corresponding entries is the same. If a and b are n-vectors, then a = b means a1 = b1, . . . , an = bn.

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الحالة الوحيدة اللي بتساوى فيها 2 vectors هي اذا تساوو بالحجم و الابعاد و الأرقام اللي جوا

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The numbers or values of the elements in a vector are called scalars. We will focus on the case that arises in most applications, where the scalars are real numbers. In this case we refer to vectors as real vectors. (Occasionally other types of scalars arise, for example, complex numbers, in which case we refer to the vector as a complex vector.) The set of all real numbers is written as R, and the set of all real n-vectors is denoted R n , so a ∈ R n is another way to say that a is an n-vector with real entries. Here we use set notation: a ∈ R n means that a is an element of the set R n

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الأرقام اللي جوا الvectors اسمها scalars

R هو حرف محجوز ما منقدر نوصف فيه الvectors

فاذا اعتبرنا انو الn-vector هو Rn معناها اذا حكينا a ∈ R n اذا الa هي scalar من الvector الكامل Rn

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