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we said we need units to measure physical quantities this process usually goes as follows 1 single out identify the class of phenomena of interest mechanics electromagnetics etc 2 list physical quantities involved 3 adopt standard reference values for fundamental quantities realize that mathe tensors were very important in the development of engineering and physics so what is a scalar vector and tensor in simple terms scalar a single quantity with no direction mechanical engineering units and quantities engineering conversions and equivalents mechanical engineering units and quantities where length l mass m time t current q t charge q most engineering measurements are of derived dimensions in secondary units the si system has 22 secondary units but there are some common ones that engineers should be familiar with when expressing derived dimensions it is helpful to be able to report the dimension in 1 dimensional symbols using only the based dimensions e g length in the international system of units si there are seven fundamental quantities length mass time electric current temperature amount of substance and luminous intensity these fundamental quantities provide a framework for describing and measuring various physical phenomena and are the starting point for deriving all other physical units basic quantities the following four quantities are used when we talk about mechanics they are often called base units as other units can be made by combining the base units length length is used to locate the position of a point in space it describes the size of a certain physical system once you have length you can have area and volume in engineering and science dimensional analysis is the analysis of the relationships between different physical quantities by identifying their base quantities such as length mass time and electric current and units of measurement such as meters and grams and tracking these dimensions as calculations or comparisons are performed about this 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work this third edition cesmm3 brings the method into line with changes in industry practices and extends its usage into several new areas back to book listing definition a vector is a mathematical object that has magnitude and direction and satisfies the laws of vector addition vectors are used to represent physical quantities that have a magnitude and direction associated with them for example the velocity of an object is a vector two components of bill of quantities boq are firm bill of quantities approximate bill of quantities to get lump sump price for a fully designed project this form is adopted one of its advantage is that it can be price accurately

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