

- C. Otro método muy común consiste en emplear la misma estructura que en el párrafo 2 y agregar además algunas características distintivas.

Ejemplos:

1. A tensor is a quantity which has magnitude, direction, and a plane in which it acts.
2. A magnetic field is a vector field that describes the magnetic influence of electric charges in relative motion and magnetized materials.
3. Physics is a science that deals with matter and energy and their interactions

NOTA:

Los pronombres relativos empleados en este tipo de definición o explicación serán **who** o **that** para personas, **when** para un periodo de tiempo, **where** para un lugar o ubicación, y **that** o **which** para cosas.

- D. Una de las formas de definición o de explicación más frecuentes prevé el uso de dos sustantivos (o frases sustantivas) en aposición, separadas por comas.

Ejemplos:

1. Arsenic and antimony, **impurity elements**, are added to germanium and silicon crystals to provide excess electrons.
2. The field-effect transistor (FET), **another type of solid-state device**, is becoming increasingly popular in electronic circuits.
3. In the CGS system, **based on the three quantities of length, mass and time**, the quantities and units of electromagnetics can only be derived by means of at least one arbitrary assumption.

## 26.2 EJERCICIO DE APLICACIÓN

Estudiar las siguientes definiciones. Generalmente, una definición incluye tres partes: el término que se desea definir, el grupo al cual pertenece, y las características que lo distinguen de los otros miembros del grupo.

<u>TERMINO</u>	<u>GRUPO</u>	<u>CARACTERISTICAS</u>
Cutoff currents	are small steady-state reverse currents	which flow when a transistor is biased into non-conduction.
Zener diodes	are voltage-reference or constant current devices	with adequate power-dissipation characteristics to operate in the breakdown region.

Analizar las siguientes definiciones e identificar el término, el grupo y las características.

1. NDOS is a program that gives you access to DOS functions and commands.
2. A junction transistor is a silicon (or germanium) crystal in which a layer of n-type silicon is sandwiched between two layers of p-type material.
3. A rectifier is a device which converts alternating current into unidirectional current by virtue of a characteristic permitting appreciable flow of current in one direction only.
4. Semiconductor rectifiers are basically nonlinear resistors having unsymmetrical voltage-current characteristics around the origin.

<u>TERMINO</u>	<u>GRUPO</u>	<u>CARACTERISTICAS</u>

### 26.3 EJERCICIO DE APLICACIÓN

Estudiar el siguiente texto. Identificar las definiciones contenidas en el mismo y luego completar la tabla.

When alternate layers of p-type and n-type semiconductor materials are arranged in a series array, various types of thyristors can be produced. The term **thyristor** is the generic name for solid state devices that have electrical characteristics similar to those of thyratron tubes. The three basic types of thyristors are the bidirectional trigger diode called the diac, the reverse blocking triode called the silicon controlled rectifier or SCR, and the bidirectional triode thyristor, called the triac. The **diac**, shown in Fig. 14, is a two-electrode, three-layer device having the same doping level at both junctions and a "floating" base. The device conducts current in either direction after the applied voltage exceeds a certain value called the "breakover voltage". The **SCR** is a three-electrode, four-layer device, as shown in Fig. 15. The SCR behaves as a conventional rectifier to block current flow in the reverse direction and as a transistor switch in the forward direction to first block current and then conduct through the device when a current pulse of sufficient magnitude is applied to the gate electrode. The **triac** is a three-electrode, five-layer device, as shown in Fig. 16, which exhibits the forward blocking forward-conducting voltage-current characteristic of the SCR structure for either direction of voltage applied to the main terminals. The schematic symbols for these thyristor devices are also shown in Figs. 14, 15, and 16.

HIPERONIMO			
SIGLA			
TERMINALES			
CAPAS			
SINONIMO			

#### Instrucción

Consultar nuevamente el Unidad 15 para obtener más detalles relacionados con las instrucciones (El imperativo y sus distintas variaciones).

En la literatura técnica se refiere generalmente al conjunto de las reglas o advertencias para un fin. Es decir, sugiere al lector hacer o no hacer algo como, por ejemplo, seguir el procedimiento para hacer funcionar una máquina. En otras palabras, refiere a la idea de impartir comandos u órdenes con el objeto de atravesar procesos tales como la instalación de dispositivos tecnológicos o resolver procedimientos matemáticos.

**EJEMPLO****INTEGRATION BY SUBSTITUTION**

[1] The substitution method turns an unfamiliar integral into one we can evaluate. In  
other words, substitution gives us a simpler integral involving the variable u. This  
lesson shows how the substitution technique works.

Let us now review the five steps for integration by substitution.

**1: Choose** a new variable u

**2: Determine** the value  $dx$

**3: Make** the substitution

**4: Integrate** resulting integral

**5: Return** to the initial variable x

Integration by substituting  $u = ax + b$

[2] These are typical examples where we use the method of substitution.

Example – Evaluate:

$$\int (2x + 3)^4 dx$$

Solution:

**1: Choose** a substitution function u.

The substitution function is

$$u = 2x + 3$$

**2: Determine** the value  $dx$

$$2x + 3 = u$$

$$(2x + 3)' dx = du$$

$$2dx = du$$

$$dx = \frac{1}{2} du$$

**3: Make** the substitution

$$\int (2x + 3)^4 dx = \int u^4 \cdot \frac{1}{2} \cdot du$$

**4: Integrate** resulting integral

$$\int (2x + 3)^4 dx = \int u^4 \cdot \frac{1}{2} \cdot du = \frac{1}{2} \int u^4 du = \frac{1}{2} \cdot \frac{u^{4+1}}{4+1} + C = \frac{u^5}{10} + C$$

**5: Return** to the initial variable: x

$$\frac{u^5}{10} + C = \frac{(2x + 3)^5}{10} + C$$

So, the solution is

$$\int (2x + 3)^4 dx = \frac{(2x + 3)^5}{10} + C$$

## Argumentación

Al argumentar, se emplea evidencia y hechos para probar si una proposición es verdadera o no. Se muestra dos caras de la misma cuestión y se abarca los conceptos más importantes relativos a las ventajas y desventajas de una cosa. Estructuralmente, el texto argumentativo consta de una presentación de una tesis seguida de un párrafo introductorio, un desarrollo y una conclusión. Está destinado a mostrar que una aseveración sobre algún fenómeno es correcta o más acertada que otras. Podríamos manifestar que es el acto de dar razones, disuadir, sacar conclusiones, y aplicar esas acciones al caso en estudio.

### ICT IN EDUCATION

**Improves Efficiency For Business.** Things like computers, email, and the internet have all greatly impacted society, but perhaps most of all, business. Things can be done almost instantly with the use of technology. The means of manufacturing goods has also been greatly streamlined. This has caused a major reduce in waste, and lower costs for the consumers.

**More Job Opportunities.** Technology has created an immense amount of new jobs in our world's economy. An entirely new group of people are needed to work with, develop, and maintain all of the new technology in homes and the workplace.

**Better Communication.** Staying in contact is easier now than it has ever been. You can talk to, video chat with, or collaborate with anybody in the entire world. This has spurred on amazing things, and a better understanding of others cultures.

**Incredible Medical Care.** A lot of new technology is constantly being developed for the medical field. Surgical procedures and every day functions have been made so simple and efficient that the level of sickness and accidents have decreased significantly.

**A Social Divide.** Technology is expensive, and keeping up with the latest trends is almost impossible for someone who isn't in the upper class. This has caused a major social divide among the population of people who can and cannot afford these technologies.

**A Generation of Laziness.** With everything made easier, or completely done for us, through the use of technology, people are slowly but surely forgetting how to do things the old fashioned way...good old hard work. You no longer have to pull out the dictionary or visit the library if you want information, you can simply type in a question and get an answer. This is also true for children, they are becoming more and more focused on things like the internet and video games that they are spending much less time outside and being active.

**Quickly Becomes Obsolete.** The more that technology advances, the faster new and more efficient versions are designed. This is a problem because you may have the newest and best piece of technology, but it will become obsolete in very little time. It is causing our landfills to be filled up with no longer used computers, cell phones, and other things that are damaging to the environment.

## Comparación

Se refiere al hecho de fijar la atención en dos o más cosas para reconocer sus diferencias y semejanzas y para descubrir sus relaciones.

### 1. FORMACION

Existen varias maneras de mostrar que existen similitudes o diferencias entre personas o cosas. Una de ellas es a través del comparativo y el superlativo de palabras descriptivas, ya sean estos adjetivos o adverbios.

Consultar nuevamente el Unidad 6 para repasar las reglas de formación del comparativo y el superlativo.

### 2. USO EN ORACIONES

Existen muchas razones para el empleo de las comparaciones en el discurso. Estas se pueden utilizar para mostrar: a. equivalencia; b. no equivalencia; c. un elemento comparado con otros; y d. incremento paralelo.

#### Equivalencia

Las siguientes palabras o construcciones se utilizan para mostrar equivalencia (es decir, lo mismo).

- alike
- all
- are similar
- as many...as
- as much...as
- as...as
- both
- compare to/with
- each
- either
- equal to
- equal/ly
- is like
- similar to
- similar/ly
- the same
- the same...as

#### Ejemplos:

1. Ideally, the waveform should be **as flat as** possible.
2. The angular speed of the wheel about this point is **the same as** the angular speed of the wheel about its center.
3. CDD **is similar to** CD or CHDIR, except it can also change the default disk drive.
4. The positive direction of the vector M depends on the choice of the coordinate system, **like** the direction of the angular velocity vector due to the action of the moment M.
5. In the case of large matrices it is not convenient to find the inverse of a matrix by using the general formula involving the determinant. It is more convenient to use a technique **similar to** GAUSSIAN ELIMINATION, which is used to solve sets of linear equations.

## No Equivalencia

Las siguientes palabras o construcciones se utilizan para mostrar no equivalencia (es decir, distinto).

- fewer...than
- greater than
- less...than
- more...than
- neither...nor...as
- not all
- not as many...as
- not as much...as
- not as...as
- not equal to
- not the same as
- palabra + er than
- unequal(ly)
- unlike

### Ejemplos:

1. Such a series is convergent if the absolute value of each term is **less than** the preceding one.
2. Hexadecimal numbers are sometimes used in computer systems because they are **much shorter than** the long strings of binary digits that the machine normally uses.
3. A divergent series, **unlike** a convergent series, has no sum to infinity.
4. When  $W_{tot}$  is positive, the kinetic energy increases (the final kinetic energy  $K_2$  is **greater than** the initial kinetic energy  $K_1$ ) and the particle is going **faster** at the end of the displacement **than** at the beginning.
5. **Not all** waves are mechanical in nature. Electromagnetic waves can propagate even in empty space, where there is no medium.

## El Superlativo

Las siguientes palabras y/o construcciones se emplean para mostrar el superlativo:

The (palabra) + est      the most / the least + (palabra)

### Ejemplos:

1. **The most versatile** and **most widely used** computer is the digital computer, which is usually referred to simply as a computer.
2. **The fastest** possible rate of rotation of a planet is that for which the gravitational force on material at the equator just barely provides the centripetal force needed for the rotation.
3. Orthogonal bases are particularly important since **the** coordinate systems **most commonly used** in physics and applied mathematics are orthogonal.
4. The inelastic collision of two bodies always involves a loss in the kinetic **energy** of the system. **The greatest** loss occurs if the bodies stick together, in which case the collision is called a completely inelastic collision.

### Incremento Paralelo

Las siguientes palabras y/o construcciones se emplean para mostrar incremento paralelo (es decir, dos comparativos).

- The (palabra+er) the.....the more.....
- The (palabra+er) the.....the less.....

#### Ejemplos:

1. **The steeper** the slope (positive or negative), **the greater** the particle speed in the positive or negative x-direction.
2. **The greater** the car speed, **the more** slowly it gains additional speed.

#### 26.4 EJERCICIO DE APLICACIÓN. Indicar la relación existente en cada fragmento de texto, es decir: Equivalencia, No Equivalencia, el Superlativo o Incremento Paralelo.

E	NE	S	IP	ORACIÓN
				1. The notion of distance is perhaps the most basic one concerning the plane.
				2. Kinetic energy K is energy associated with the state of motion of an object. The faster the object moves, the greater is its kinetic energy. When the object is stationary, its kinetic energy is zero.
				3. Superconductors are materials that lose all electrical resistance. A number of such materials require very low temperatures, but some become superconducting at temperatures as high as room temperature.
				4. The required result follows on dividing both sides of (1) by L. Parseval's identity is valid under less restrictive conditions than that imposed here.
				5. If R is a row-reduced echelon matrix which is row-equivalent to A, then R = PA where P is an m × n invertible matrix. The solutions of the system AX = Y are exactly the same as the solutions of the system RX = PF (= Z).
				6. Among other surprises, Einstein's theory predicts that the rate at which a clock runs depends on how fast the clock is moving relative to the observer: <b>the faster</b> the motion, <b>the slower</b> the clock rate.
				7. Even in 3-space, one has to rely on geometric intuition to obtain the cosine of the angle between A and B, and this intuition is less clear than in the plane.
				8. This factorization provides us with an effective tool for finding the greatest common divisor of a finite number of polynomials, and in particular, provides an effective means for deciding when the polynomials are relatively prime.

**UNIDAD 27****RELACIONES LÓGICAS****ADICIÓN-AGREGADO**

Existen variadas razones por las cuales las personas hacen uso de la lectura; pero en el ámbito académico, la lectura se lleva a cabo principalmente para obtener información sobre un Unidad en particular. Es importante que el lector comprenda la relación entre la información proporcionada y la información precedente. A menudo la información se presenta de manera tal que sugiere un refuerzo de lo mencionado anteriormente, o para mostrar una similitud con lo que se ha expresado previamente.

Cuando los autores brindan una explicación acerca de algo, suelen ofrecer ejemplos para apoyar su argumento a favor de un punto de vista en particular. Pueden optar por presentar la información en forma deductiva, en cuyo caso dan una generalización en primer término y a continuación incluyen los ejemplos necesarios para apoyar el principio general. Otros prefieren suministrar ejemplos en primer lugar, y luego efectuar la generalización. Dicha forma de presentación se denomina inductiva.

**1. REFUERZO**

Los marcadores utilizados para denotar **refuerzo**, ya sea en un texto realizado en forma deductiva o inductiva, son:

- additionally
- equally
- neither
- again\*
- furthermore
- nor
- also\*
- in addition
- too
- as well as
- moreover
- what is more
- besides
- not...either

\*ocurren en posición inicial

**EJEMPLOS:**

1. Table 13.1 gives the values of  $g$  at several locations. **In addition** to moderate variations with latitude, there are small variations due to elevation, differences in local density, and the earth's deviation from perfect spherical symmetry.
2. **As well as** the kinematic equations, the equations of rotational motion include  $T = I\alpha$ , the analog of  $F = ma$ .
3. Sometimes a function is known only as a set of values for corresponding values of a variable and not as a general formula that can be integrated. **Also**, many functions cannot be integrated in terms of known standard integrals.

## 2. SIMILITUD

Los marcadores empleados para agregar información destinada a mostrar *similitud* con lo expresado previamente son:

- besides
- correspondingly
- equally\*
- in the same way
- likewise
- similarly

\*ocurre en posición inicial

### EJEMPLOS

1. We do not need the second equation; we know that the  $y$ -component of force is perpendicular to the displacement, so it does no work. **Besides**, there is no  $y$ -component of acceleration, so  $\Sigma F_y$  must be zero anyway.
2. There is a one-to-one correspondence between vectors  $A$  and planes of the form  $A \cdot r = A_i x^i = 1$ . **In the same way**, there is a one-to-one correspondence between symmetric tensors  $T_{ik}$  and quadric surfaces of the form  $T_{ik} x_i x^k = 1$ .
3. We use the Greek capital letter  $\Delta$  (delta) to represent a *change* in a quantity, equal to the *final* value of the quantity minus the *initial* value – never the reverse. **Likewise**, the time interval from  $t_1$  to  $t_2$  is  $\Delta t$ , the change in  $t$ :  $\Delta t = t_2 - t_1$  (final time minus initial time).

Otros marcadores o nexos usados para agregar información explícitamente, ya sea en la forma de refuerzo o similitud, son:

- another
- further
- other additional

### EJEMPLOS

1. This type of coordinate system, known as a rectangular Cartesian coordinate system, can have two axes, as on a flat surface, such as a map, or three axes, when depth or height also have to be specified. **Another** type of coordinate system (POLAR COORDINATES) expresses the position of a point as radial distance from the origin (the *pole*), with its direction expressed as an angle or angles (positive when anti-clockwise) between the radius and a fixed axis
2. The ratios  $h/e$  and  $\Phi/e$  are constants, and so we would expect a plot of the measured stopping potential  $V_{stop}$  versus the frequency  $f$  of the light to be a straight line, as it is in Fig. 38-2. **Further**, the slope of that straight line should be  $h/e$ .

**27.1 LEER LOS SIGUIENTES PÁRRAFOS E IDENTIFICAR LOS MARCADORES EMPLEADOS PARA DENOTAR EL AGREGADO DE INFORMACIÓN. SUBRAYAR LUEGO LA INFORMACIÓN AGREGADA.**

1. Transition elements are characterized by variable valency, complex ion formation, and the ability to form coloured compounds. In addition to the normal transition series there are two inner transition series called the lanthanide series and the actinide series respectively.
2. In fact, it is clear that  $|A \cos\varphi|$  always gives the length of the segment of the axis  $u$  between the planes drawn through the end points of A perpendicular to  $u$ . Moreover, the direction from the projection (onto  $u$ ) of the initial point of A to the projection of the end point of A is the same as the positive direction of  $u$  if  $\varphi < \pi/2$  and the opposite if  $\varphi > \pi/2$ .
3. In physics, we deal with two completely different, yet subtly related, objects: particles and fields. The former is no doubt familiar to the reader. Examples of the latter are the gravitational, electric, and magnetic fields, as well as the less familiar velocity field of a fluid such as water in a river or air in the atmosphere.
4. We can derive a relationship between volume and temperature changes for an infinitesimal adiabatic process in an ideal gas. Equation (19.13) gives the internal energy change  $dU$  for *any* process for an ideal gas, adiabatic or not, so we have  $dU = nCV dT$ . Also, the work done by the gas during the process is given by  $dW = p dV$ .
5. The shear force supplied by the earthquake is more than 3 tons. The large shear modulus of brass makes it hard to deform. Further, the plate is relatively thick (0.50 cm), so the area  $A$  is relatively large and a substantial force  $F_{\parallel}$  is needed to provide the necessary stress  $F_{\parallel}/A$ .
6. If the total energy is  $E_1$  and the particle is initially near  $x_1$ , it can move only in the region between  $x_a$  and  $x_b$  determined by the intersection of the  $E_1$  and  $U$  graphs. Again,  $U$  cannot be greater than  $E_1$  because  $K$  cannot be negative.

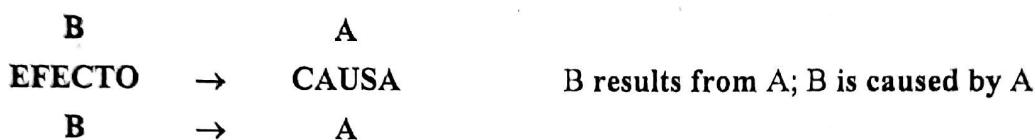
**CAUSA-EFECTO**

La comprensión de las distintas maneras de expresar la relación entre las causas y los efectos de una acción adquiere mucha importancia cuando se efectúa la lectura en inglés. Si un argumento comienza con *efectos o resultados*, las *causas* son las razones que lógicamente conducen a dichos resultados. La relación causa-efecto se emplea frecuentemente en los textos académicos.

Existen muchas maneras de expresar causa y efecto; antes de considerar algunas de ellas, se debe notar cuidadosamente la siguiente distinción:



- *The pull of the earth CAUSES the velocity TO DECREASE.*
- *The centripetal force CAUSES an object TO MOVE in a curved path rather than continuing in a straight line.*
- *The current induced in the plate RESULTS IN mechanical energy being dissipated as thermal energy.*



- *The acceleration IS CAUSED BY three horizontal forces.*
  - *A magnetic moment RESULTS FROM a circulating current (a motion of electric charge).*
1. A menudo, la selección de verbos en una oración indicara una relación causa efecto. Los siguientes verbos se emplean para vincular una causa con un efecto.

• allow    • be caused by    • be produced by    • bring about    • cause    • enable  
• prevent    • produce    • result    • result from    • result in

#### EJEMPLOS:

1. Click **OK** to close the *Define New Bullet* dialog box. The arrow picture appears in place of the bullets. Notice that the size of the new bullets **causes** the text to be uneven.
2. If you choose to format the picture as a floating object, Word positions the image precisely on the page, and **allows** the text to wrap around it in one of several available formats.
3. The Insert Table dialog box **enables** you to create large tables by specifying up to 63 columns and thousands of rows.
4. In the Paragraph group, Word contains features that control how a paragraph breaks within a document and between pages. You control the pagination in a document by preventing awkward breaks called **widows** and **orphans**, keeping text together, keeping lines together, and determining where page breaks will occur.

2. Entre los conectores empleados para especificar una causa se encuentran los siguientes:

- as
- as the/a result of
- because
- due to
- in response to
- since

#### EJEMPLOS

1. The AutoCorrect dialog box is accessible from the Proofing page of the Word Options dialog box. **Because** AutoCorrect is configurable, you can add your own words to the list of replacements.
2. We shall now describe the modification necessary to adapt the preceding results to vector spaces over the complex numbers. We wish to preserve the notion of a positive definite scalar product as far as possible. **Since** the dot product of vectors with complex coordinates may be equal to 0 without the vectors being equal to 0, we must change something in the definition.
3. Entre los conectores de oraciones empleados para introducir un resultado se encuentran los siguientes:

- with the result that
- so that
- thus
- therefore
- consequently
- hence
- for this reason

#### EJEMPLOS

1. The biological shield around the core of a nuclear reactor should absorb all radiation from the core **so that** people working outside receive no dose from it at all.
2. If you are interested in insulating your house or in keeping cola cans cold on a picnic, you are more concerned with poor heat conductors than with good ones. **For this reason**, the concept of *thermal resistance R* has been introduced into engineering practice.
3. From arithmetic, the only rational roots must be integers, and must divide 1, so the only possible rational roots are  $\pm 1$ , which are not roots. **Hence** there is no rational eigenvalue.
4. The line  $\mathcal{L}$  perpendicular to  $y = 2x - 3$  at  $(3, 3)$  must pass through the center of the circle. By Theorem 3.2, the slope of  $\mathcal{L}$  is  $-\frac{1}{2}$ . **Therefore**, the slope-intercept equation of  $\mathcal{L}$  has the form  $y = -\frac{1}{2}x + b$ .

4. Otra manera de mostrar una relación causal consiste en introducir la causa mediante la conjunción **IF**, y los verbos contenidos tanto en la oración que expresa la causa como en la oración que expresa el efecto se encuentran en tiempo presente:

**EJEMPLOS:**

1. If  $c$  is a real number, then  $cf$  is differentiable.
2. If two vectors have the same direction, they are parallel.
3. If the pressure becomes too great, the valve opens.
4. If you close the document or Word by accident, a prompt appears, asking whether you want to save your document.
5. If your computer is running the Windows 8.1 or Windows 7 operating system, some screenshots and steps might appear slightly different than those provided in this book.

**27.2 LEER LAS SIGUIENTES ORACIONES Y SUBRAYAR AQUELLA PARTE QUE EXPRESA LA CAUSA.**

1. Because AutoCorrect is configurable, you can add your own words to the list of replacements.
2. If your computer has access to multiple printers, you might need to choose a destination printer for your document.
3. By definition,  $\omega(t)$  is the derivative of  $\theta(t)$  with respect to time. Therefore, we can find  $\theta(t)$  by integrating  $\omega(t)$  with respect to time.
4. Additional information indicates the settings in effect for the backup and which diskette contains which files. The Define Drive and backup type selection is used when you first configure PCBACKUP and later if you need to change your configuration due to a change in hardware or a desire to change your backup type.
5. The Norton Utilities saves configuration information in initialization files (\*.INI). Since each user on a network will likely have a unique hardware configuration, the NU environment variable must point to a directory on the user's local hard disk.

**CONDICIÓN-PREDICCIÓN**

Una *predicción* consiste en manifestar algo sobre un hecho en particular que está relacionado con el cumplimiento de una condición previa. Constituye un tipo especial de inferencia en el cual expresamos de antemano nuestro pensamiento sobre lo que ocurrirá en el futuro. En consecuencia, resulta imposible predecir sin tener conocimiento de una condición existente. Al examinar la información existente, se puede sacar una conclusión lógica sobre lo que puede ocurrir a continuación. Las predicciones de resultados basadas en condiciones existentes pueden expresarse con distintos grados de certeza. No son absolutas y suelen variar de acuerdo con el contexto. Por ejemplo:

**1. La certeza (100%) puede expresarse por:**

- will (definitely, certainly) • sure • without question
- certain • without a doubt •

**2. La probabilidad (75% - 90%) puede expresarse por:**

- probable • probably (75%) • likely (75%) • most probable
- most probably • highly probable • most likely • highly likely (90%)

**3. La posibilidad puede expresarse por:**

- may (not) • might (not) • can • could
- possible • possibly • perhaps •

**4. La improbabilidad (25% - 10%) puede expresarse por:**

- improbable • unlikely (25%) • doubtful • questionable (25%) • probably not (25%)
- most/highly improbable/unlikely (10%) • most/highly doubtful/questionable (10%)
- most probably not (10%)

**5. La imposibilidad puede expresarse por:****a. presente o futura**

cannot, could not  
not possible, impossible

**b. pasada**

could not  
not possible, impossible

Cuando existe una condición necesaria en un proceso, se emplea las siguientes expresiones:

For Y to occur/happen/take place

X must be present or  
there must be Y  
Y depends on X

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En una *relación de condición-predicción*, la expresión de la condición va precedida de **if** sin importar el grado de certeza de la predicción.

Los tiempos de verbo también revisten su importancia ya que la distinción entre la expresión de una condición manifestada en el presente debe relacionarse con los eventos de la predicción que ocurrirán en el futuro.

Ejemplos:

1. If you have only one Word document open, the close button will also close Word.

**CONDICION**

If you have only one Word document open,

**PREDICCION**

the close button will also close Word.

2. If you use the Word Web App, you will not be able to complete all of the exercises in this book.

**CONDICION**

If you use the Word Web App,

**PREDICCION**

you will not be able to complete all of the exercises in this book.

3. If you do not see the PERSONAL heading on the File tab, you will need to access setup to make it appear.

**CONDICION**

If you do not see the PERSONAL heading on the File tab,

**PREDICCION**

you will need to access setup to make it appear.

### 27.3 LEER LAS SIGUIENTES ORACIONES E IDENTIFICAR LA CONDICIÓN Y LA PREDICCIÓN.

1. The momentum  $\vec{p}$  of any particle-like body cannot change unless a net external force changes it.
2. If you have only one Word document open, the close button will also close Word.
3. All coordinate systems and bases will be assumed to be right-handed unless the contrary is explicitly stated.
4. If you copy multiple items and then click Paste, only the last item copied will be pasted.
5. The law of conservation of angular momentum states that the total angular momentum of a system cannot change unless a net outside torque acts on the system.
6. If the gas temperature rises above the critical point, it will never liquify.
7. Unless an incident beam of light is perpendicular to the surface, refraction changes the light's direction of travel.
8. If the rated voltage level is exceeded, the transformer will draw additional reactive

### EJEMPLIFICACIÓN

Generalmente, en los textos se suele observar la utilización de ejemplos para explicar un punto o ilustrar una idea cuando el objetivo principal consiste en instruir al lector acerca de una materia en particular. De tal modo, es importante distinguir entre la idea o ideas presentadas, y la ilustración de dichas ideas mediante ejemplos.

El escritor suele manifestar *explicativamente* cuales conceptos constituyen ejemplos a través del uso de nexos tales como los consignados en la siguiente tabla.

- |                          |                    |                |
|--------------------------|--------------------|----------------|
| • a second/third example | • exemplifies      | • mainly       |
| • and                    | • for example      | • notably      |
| • as an example          | • for instance     | • or           |
| • as an example of this  | • illustrated by   | • or better    |
| • as follows             | • illustrates      | • or rather    |
| • cases of               | • illustrations of | • particularly |
| • chiefly                | • in particular    | • say          |
| • e.g.                   | • included         | • seen in      |
| • especially             | • including        | • shown by     |
| • examples of            | • instances of     | • shows        |
| • exemplified by         | • like             | • such as      |

**EJEMPLO 1:**

1. We call  $S$  the domain of definition of the function. **For example**, the domain of definition of the square root function is the collection of all numbers  $\geq 0$ .
2. Windows 10 is for PC users at home, work, and school. It is a powerful tool that controls the user interface, storage devices, other software, peripheral devices, networks/security, system resources, and task scheduling. Windows 10 is the latest operating system standard for computers, laptops, and tablets. Windows 10 also comes in multiple versions, **such as** Windows 10 Home and Windows 10 Pro, to support your personal needs and how you use your device.
3. By default, AutoCorrect is a feature that replaces symbols, commonly misspelled words, and abbreviations with specific text strings. **For instance**, to add the Copyright symbol, you type (c) and it automatically inserts the symbol ©.
4. On occasion, you might need to move a window out of the way without exiting the associated application. This is where the three buttons in the upper-right corner of the Word screen come in handy. The Minimize button minimizes the window display – e.g., the window disappears and is only accessible from the Windows taskbar.
5. Equations or inequalities which relate  $x$  and  $y$  or  $r$  and  $\theta$  define loci in the reference plane. **For instance**, the set of those points (and only those) whose coordinates satisfy such a statement forms the graphical representation or locus of the mathematical statement.
6. The term “sample” implies the existence of a sampling error, e.g., the results obtained on the portions taken are only estimates of the concentration of a constituent or the quantity of a property present in the parent material.
7. Particle induced x-ray emission is produced by the excitation of heavier particles **such as** protons, deuterons, or heavy atoms in varying degrees of ionization.
8. The circumference of a circle is an irrational multiple, namely  $\pi$ , of the diameter. Other irrational numbers appear when we try to evaluate some of the basic functions in mathematics. **For example**, if we try to find the values of a trigonometric function, say  $\sin x$ , when  $x$  has the value  $60^\circ$ , we are led to the irrational number  $\sqrt{3}/2$ ; similarly, if we evaluate the logarithmic function  $\log x$ , even for rational values of  $x$ , we usually are led to irrational numbers.
9. The following sections describe an algorithm, or a systematic procedure, for solving linear systems. The basic strategy is *to replace one system with an equivalent system (e.g., one with the same solution set) that is easier to solve*.

**CONTRASTE**

En los textos de lectura se suele omitir ciertos elementos de conexión sin que se afecte el flujo de su comprensión. Sin embargo, rara vez se omite a los conectores que denotan contraste dentro de una oración o párrafo, ya que, sin ellos, el párrafo bajo lectura carecería de sentido y sería confuso. Hay muchas formas de mostrar que existe un contraste entre las distintas ideas.

**1** El indicador más simple de la existencia de un *contraste* y que también pone en evidencia que lo *opuesto* también es verdadero, es cuando una oración es encabezada por uno de los siguientes marcadores:

- by contrast
- by way of contrast
- conversely
- in comparison
- on the contrary
- on the one hand; ...on the other hand
- opposite
- 

**EJEMPLOS:**

1. The ribbon is a visual interface that allows you to work in a file and perform tasks such as changing fonts, creating charts, and formatting numbers. The Backstage view, **on the other hand**, is a visual interface that enables you to use and master Excel. file management features—functions that allow you to do things to a file rather than in a file.
2. In a rectangular Cartesian coordinate system with the same origin and the  $x$ -axis at  $\theta = 0$ , the  $x$ - and  $y$ -coordinates of the point  $(r, \theta)$  are  $x = r \cos\theta$   $y = r \sin\theta$ . **Conversely**,  $r = \sqrt{x^2 + y^2}$  and  $\theta = \tan^{-1}(y/x)$ .

**2** En ocasiones, los conectores que denotan contraste se emplean para indicar que lo siguiente es un *reemplazo* de lo que se dijo anteriormente. En el siguiente cuadro se incluye ejemplos de los mismos.

- alternatively
- an/the alternative is...\*
- but
- instead
- it might be better if...\*
- rather
- then
- whereas

\*ocurren en posición inicial

**EJEMPLOS:**

1. Average speed  $s_{avg}$  is a different way of describing “how fast” a particle moves. **Whereas** the average velocity involves the particle’s displacement  $\Delta x$ , the average speed involves the total distance covered (for example, the number of meters moved), independent of direction.
2. An external force can change the kinetic energy or potential energy of an object without doing work on the object—that is, without transferring energy to the object. **Instead**, the force is responsible for transfers of energy from one type to another inside the object.

3. One way to study the waves of Fig. 16-1 is to monitor the wave forms (shapes of the waves) as they move to the right. **Alternatively**, we could monitor the motion of an element of the string as the element oscillates up and down while a wave passes through it.

**3** Cuando el escritor desea expresar que lo dicho anteriormente es verdadero o correcto, y lo expresado a continuación es, *en contraste*, también verdadero o correcto, se suele emplear los siguientes conectores:

- although
- even though
- nonetheless
- but
- however
- on the other hand
- despite that
- in spite of
- though
- even if
- nevertheless

### EJEMPLOS:

1. A particle is in uniform circular motion if it travels around a circle or a circular arc at constant (uniform) speed. **Although** the speed does not vary, the particle is accelerating because the velocity changes in direction.
2. Remember that, although we have used displacement vectors here, the rules for addition and subtraction hold for vectors of all kinds, whether they represent velocities, accelerations, or any other vector quantity. **However**, we can add only vectors of the same kind.
3. If the rotation axis of a rigid body is not a symmetry axis,  $\vec{L}$  does not in general lie along the rotation axis. Even if  $\vec{\omega}$  is constant, the direction of  $\vec{L}$  changes and a net torque is required to maintain rotation.

### **27.4 IDENTIFICAR LOS INDICADORES DE CONTRASTE EN LOS SIGUIENTES PÁRRAFOS.**

1. In many cases the uncertainty of a number is not stated explicitly. Instead, the uncertainty is indicated by the number of meaningful digits, or significant figures, in the measured value.
2. Some physical quantities, such as time, temperature, mass, and density, can be described completely by a single number with a unit. But many other important quantities in physics have a *direction* associated with them and cannot be described by a single number.
3. We denote the **scalar product** of two vectors  $\vec{A}$  and  $\vec{B}$  by  $\vec{A} \cdot \vec{B}$ . Although  $\vec{A}$  and  $\vec{B}$  are vectors, the quantity  $\vec{A} \cdot \vec{B}$  is a scalar.
4. The most obvious example of a sequence is the sequence of natural numbers. Note that the integers are not a sequence, although we can turn them into a sequence in many ways.

5. It can be rigorously shown that the functional has the same minimizing solution, even if one allows functions that do not have enough derivatives to satisfy the differential equation.
6. When  $F$  is the field  $R$  of real numbers, the complex conjugates appearing in (c) and (e) are superfluous; however, in the complex case they are necessary for the consistency of the conditions.
7. The introduction of the Minkowski world in special relativity theory was a revolutionary advance over the 3-dimensional space of Newtonian mechanics. But the inner structure of the Minkowski world does not reflect gravitational phenomena.
8. The Swedish mathematician Ivar Fredholm's main interest was in solving linear integral equations, but his compatibility criterion is also applicable to linear matrix systems, as well as linear differential equations, linear variational problems, and many other linear systems.
9. Every inner product gives rise to a norm that can be used to measure the magnitude or length of the elements of the underlying vector space. However, not every such norm used in analysis and applications arises from an inner product.
10. The error function integral cannot be written in terms of elementary functions. Nevertheless, its importance in various applications means that its properties have been well studied, and its values tabulated

## LISTADO

Cuando se lee, resulta importante reconocer y comprender la relación según la cual las oraciones y grupos de oraciones se combinan para presentar la información. Esta información puede vincularse por medio de una *palabra o marcador de conexión*.

Al efectuar una lista, una enumeración, y al impartir instrucciones, se cataloga lo que se dice. Cabe destacar que la mayoría de las enumeraciones pertenecen a conjuntos definidos claramente. En la siguiente tabla se incluye un listado de los marcadores que pueden emplearse para mostrar el orden en el cual se debe expresar los hechos.

### MARCADORES DE LISTADO Enumerativos

- first(ly), second(ly), third(ly)
- 1, 2, 3, etc.
- one, two, three, etc.
- a, b, c, etc.
- next, then
- finally, last, lastly
- in the first/second/third place
- for one thing...(and)for another(thing)
- for a start
- to begin/start with, and to conclude

### MARCADORES DE LISTADO De Refuerzo

- also, further, furthermore,
  - moreover, in addition
  - first and foremost
  - first and most important(ly)
  - above all, on top of it all
  - Last but not least
  - what is more
- } indican el comienzo de un orden descendente
- } indican el final de un orden ascendente

### MARCADORES DE LISTADO De Igualdad

- correspondingly, equally
- likewise, similarly
- in the same way, by the same token

Existen varias maneras de mostrar relaciones de secuencia. Aunque las expresiones consignadas en la tabla no constituyen la totalidad de ellas, las mismas reflejan las utilizadas más habitualmente en los textos que incluyen listado y enumeración. Las expresiones terminadas en -ly se emplean generalmente al efectuar un listado.

### EJEMPLO

Theorem 1.11.

Let  $A$  be an  $n \times n$  matrix. Then the following conditions are equivalent:

- (i)  $A$  is nonsingular.
- (ii)  $A$  has  $n$  nonzero pivots.
- (iii)  $A$  admits a permuted LU factorization:  $P A = LU$ ;

One should be aware of a couple of practical complications. First, to implement the permutation  $P$  of the rows that makes  $A$  regular, one needs to be clairvoyant: it is not always clear in advance when and where a required row interchange will crop up. Second, any row interchange performed during the course of the Gaussian Elimination algorithm will affect the lower triangular matrix  $L$ , and precomputed entries must be permuted accordingly.

## 27.5 IDENTIFICAR LOS MARCADORES DE LISTADO DEL SIGUIENTE TEXTO.

We observe the following fundamental properties that serve to uniquely characterize the Green's function (11.59). First, since the delta forcing vanishes except at the point  $x = y$ , the Green's function satisfies the homogeneous differential equation

$$\frac{\partial^2 G}{\partial x^2}(x, y) = 0 \text{ para todo } x \neq y \quad (11.60)$$

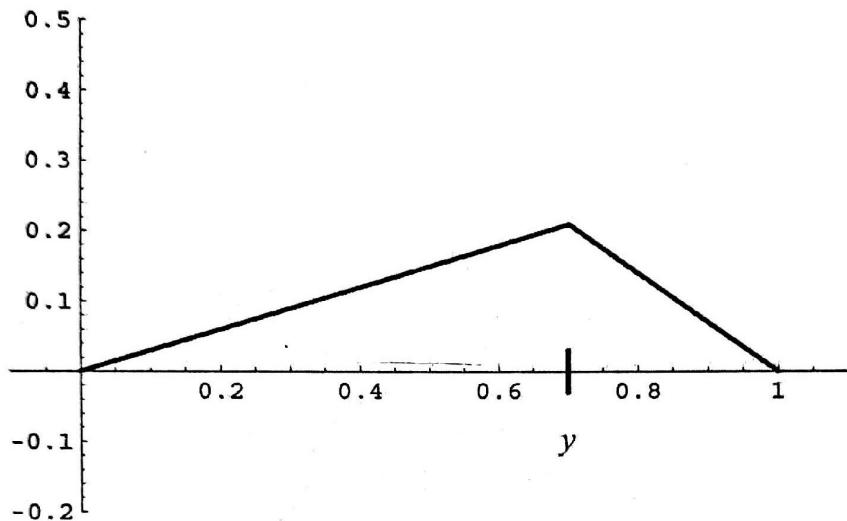


Figure 11.11. Green's function for a Bar with Fixed Ends.

Secondly, by construction, it must satisfy the boundary conditions

$$G(0; y) = 0 = G(1; y).$$

Thirdly,  $G$  is continuous, but has a  $90^\circ$  corner at  $x = y$ , which implies that its derivative  $\partial G/\partial x$  has a jump discontinuity of magnitude  $-1$  there. The second derivative  $\partial^2 G/\partial x^2$  has a delta function discontinuity at  $x = y$ , and thereby solves the original boundary value problem (11.57). Finally, we observe that the Green's function is symmetric in  $x$  and  $y$ :

$$G(x; y) = G(y; x) \quad (11.61)$$

This symmetry property is a consequence of the underlying symmetry or self-adjointness" of the boundary value problem; this aspect will be discussed in more depth in the following section. Symmetry has the interesting physical consequence that the response of the bar at position  $x$  due to an impulse force concentrated at position  $y$  is exactly the same as the response of the bar at position  $y$  due to an impulse being applied at position  $x$ . This turns out to be a rather general, although perhaps unanticipated phenomenon. Analogous results for the discrete cases of mass-spring chains, circuits, and structures can be found in exercises below.

**SECUENCIA EN EL TIEMPO**

Ya hemos visto algunos de los marcadores empleados para enumerar el orden según el cual se expresan las ideas al efectuar listados o impartir instrucciones. Sin embargo, no se mencionó a aquellos marcadores que denotan la *secuencia en el tiempo* de acuerdo con la cual los eventos ocurren. Reviste igual importancia reconocer la secuencia de eventos, particularmente en actividades tales como programación, repetición de hechos históricos, realización de actividades rutinarias y la conducción y realización de experimentos.

Normalmente, los eventos no se suceden aleatoriamente sino que se producen **antes**, durante o después de otros eventos. La secuencia en el tiempo puede ser cronológica, lógica o causal. Una vez establecida una referencia en el tiempo, ciertos adjetivos y adverbios pueden ordenar la información posterior con relación a la misma. En las siguientes tablas se incluye ejemplos de relacionadores temporales.

**TABLA 1**

*Previos* a la referencia de tiempo dada, es decir, **antes** (before)

RELACIONADORES TEMPORALES			
Adjetivos	<ul style="list-style-type: none"> <li>• earlier</li> <li>• previous</li> </ul>	<ul style="list-style-type: none"> <li>• former</li> <li>• prior</li> </ul>	<ul style="list-style-type: none"> <li>• preceding</li> </ul>
Adverbios	<ul style="list-style-type: none"> <li>• already</li> <li>• as yet</li> <li>• before</li> <li>• beforehand</li> <li>• before that</li> <li>• before this</li> </ul>	<ul style="list-style-type: none"> <li>• earlier</li> <li>• first</li> <li>• formerly</li> <li>• hitherto</li> <li>• up to now/then</li> <li>• until now/then</li> <li>• before now/then</li> <li>• by now/then</li> </ul>	<ul style="list-style-type: none"> <li>• previously</li> <li>• so far</li> <li>• yet</li> <li>• prior</li> <li>• in the beginning</li> <li>• (long) ago</li> </ul>

**EJEMPLOS**

1. The Undo command lets you cancel or undo your last Word command or action. You can click the Undo command as many times as necessary to undo **previously** executed commands.
2. You can apply styles to tables in much the same way you learned to apply styles to text in previous lessons, by positioning the insertion point in a table and selecting a style from the Table Styles gallery. You can preview the style **before** applying it and change the style as many times as needed.
3. Excel validation rules pertain only to new data that is entered into the workbook, not to data that existed in the workbook **prior** to creating the rules.
4. When you **save** a file, you can save it to a folder on your computer's hard drive, a network drive, disc, CD, USB drive, OneDrive, or other storage location. You must **first** identify where the document is to be saved. The remainder of the Save process is the same, regardless of the location or storage device.

**TABLA 2**

*Simultáneos con la referencia de tiempo dada, es decir, during (durante)*

RELACIONADORES TEMPORALES			
Adjetivos	<ul style="list-style-type: none"> <li>• contemporary</li> <li>• coexisting</li> <li>• coinciding</li> </ul>	<ul style="list-style-type: none"> <li>• simultaneous</li> <li>• concurrent</li> </ul>	
Adverbios	<ul style="list-style-type: none"> <li>• at present</li> <li>• at this point</li> <li>• now</li> <li>• today</li> <li>• for the time being</li> <li>• at the moment</li> <li>• presently</li> <li>• then</li> </ul>	<ul style="list-style-type: none"> <li>• meantime</li> <li>• meanwhile</li> <li>• in the meantime</li> <li>• in the meanwhile</li> <li>• at the same time</li> <li>• here</li> <li>• throughout</li> <li>• when</li> </ul>	

**EJEMPLOS**

1. Word enables you to insert a citation and create a source **at the same time**.
2. In the *Select Data Source* dialog box, locate and select the data file. Click Open. A dialog box named Error In XML might appear **at this point**. If so, click OK to dismiss the dialog box and proceed.
3. **When** you launch Excel and click Blank workbook, the program opens a new workbook and displays a blank worksheet.
4. You can use the commands on the View Menu to display a single file list, two file lists, or information on files in the current directory. You can also display a list of groups and program items and a list of files and directories **at the same time**.

*Posteriores a la referencia de tiempo dada, es decir, después (after)*

RELACIONADORES TEMPORALES			
Adjetivos	<ul style="list-style-type: none"> <li>• ensuing</li> <li>• subsequent</li> </ul>	<ul style="list-style-type: none"> <li>• following</li> <li>• next</li> </ul>	<ul style="list-style-type: none"> <li>• later</li> </ul>
Adverbios	<ul style="list-style-type: none"> <li>• after</li> <li>• afterwards</li> <li>• finally</li> <li>• immediately</li> <li>• after that</li> <li>• after this</li> </ul>	<ul style="list-style-type: none"> <li>• last</li> <li>• later</li> <li>• next</li> <li>• since</li> <li>• since then</li> <li>• eventually</li> </ul>	<ul style="list-style-type: none"> <li>• subsequently</li> <li>• suddenly</li> <li>• then</li> <li>• by the end</li> <li>• soon</li> <li>• by the time</li> </ul>