

August 1-4, 2009

Dear Mom and Dad,

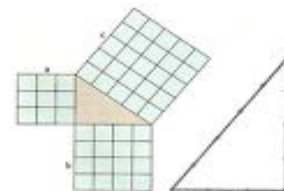
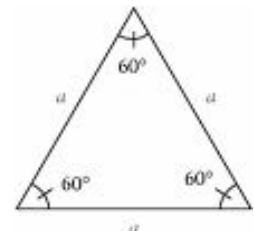
For your twenty-fifth anniversary, we presented you with 25 arithmetical equations, using only the digits 2 and 5, all of which gave the result 25 [for example, $5^2 = 25$]. Then, for your fiftieth anniversary, we gave you videos of what we thought were the 50 most enjoyable and/or important films (mostly comedy) of the twentieth century. Now, for your sixtieth anniversary, we are providing you with 60 interesting facts about the number 60 [perhaps you can have fun with the “google” to verify some of the more obscure facts].



With much love,

George & Francis & Barbara & Rachel
Michael & Deborah & Isabelle & Lilly

- There are **60** seconds in a minute
- There are **60** minutes in an hour
- The simplest plane geometrical figure is an *equilateral triangle*. The angle of such a triangle is **60°**
- A soccer ball has **60** vertices. The 1996 Nobel Prize in Chemistry was given for the discovery of a new form of carbon [adding to diamond, graphite, and amorphous carbon, all of which were already known for a long time] called *buckminsterfullerene* – this has the formula C_{60}
- The divisors of 60 are: 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, and 60. There are twelve divisors in all. It turns out that **60** is the *smallest* number with as many as twelve divisors. and **60** is the *smallest* number divisible by all of the numbers from 1 to 6.
- Furthermore, from the above list of divisors, remove 6 and 10 (because $6 \times 10 = 60$, and 6 and 10 have 2 as a common divisor), as well as 2 and 30 (for similar reason), as well as 60. The ones that remain, i.e., 1, 3, 4, 5, 12, 15, and 20, are called proper *unitary* divisors. Their sum, i.e., $1+3+4+5+12+15+20 = 60$; this means that **60** is a *unitary perfect number*
- Keeping in mind the first *Pythagorean triplet*: 3/4/5 (i.e., $3^2 + 4^2 = 5^2$), notice that $3 \times 4 \times 5 = \mathbf{60}$



- Sixty can be expressed as the sum of the consecutive twin primes 29 and 31, i.e., $29+31 = 60$. This is a special case of *Goldbach's conjecture*, one of the most important (as well as oldest) still-unsolved problems in all of mathematics, i.e., the hypothesis that every even integer (starting with 4) can be expressed as a sum of two prime numbers

- Sixty can be expressed as the sum of four consecutive prime numbers, i.e., $11+13+17+19 = 60$

- **60** itself is between the consecutive twin primes 59 and 61

- The ancient *Babylonian* number system was in base **60**

- As studied by your grandson, the **60th** proposition of Euclid's "*Elements*" is a generalization of the *Pythagorean theorem*, and is considered a predecessor of the *law of cosines* in trigonometry



- For many years (including the time period when your elder son carried out his graduate studies), the standard NMR spectrometers that were useful for chemistry research had a field strength of **60** MHz

- Many years ago, your younger son was thrilled to work on a *Macintosh-IIci* desktop computer with a **60** MB hard drive. Today, one of your grand-daughters owns an *iPod* with **60** GB of memory – that represents a thousand-fold increase in memory, now contained within a simple hand-held music player



- A *piano* is known for having 88 keys, but an *electric keyboard* (similar to what you presented to your first grand-daughter on the occasion of her bat mitzvah) often has exactly **60** keys

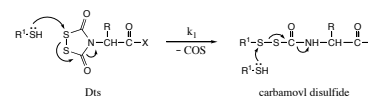
- At the interface of *Macintosh* computers and *keyboards* – it has just been observed that, not counting the narrow keys on the top row and off on the bottom right side (e.g., pg up, pg dn, home, end), but including the space bar, the keyboard on a modern Mac laptop has exactly **60** keys



- The very first inorganic crystal ever grown by one of your daughters-in-law was lanthanum trichloride (LaCl_3) doped with the element of atomic number **60**, which is *neodymium* (Nd)

- *Acetic acid*, $\text{CH}_3\text{CO}_2\text{H}$, has a molecular mass of **60** daltons

- *Carbonyl sulfide*, COS, the innocuous gaseous by-product from thiolytic removal of the *dithiasuccinoyl* (Dts) amino protecting group, also has a molecular mass of **60** daltons



- A well-known mitochondrial *chaperonin*, important for protein folding, is called *heat shock protein* (Hsp) **60** – its molecular mass is **60** kilodaltons

- The *electricity* in our American wall sockets is *alternating current*, transmitted at **60** Hz

- The most commonly used light bulb burns at **60** watts – this is not enough illumination, in your considered medical opinion, to read by



- Considering your three favorite composers, *Mozart*, *Verdi*, and *Puccini*, their total number of operas = $22+28+10 = \mathbf{60}$

- For many years, the standard for home runs in one season was the record set by *Babe Ruth* in 1927, when he hit **60** home runs



- In baseball, the distance from home plate to the pitcher's mound is exactly **60** feet [and 6 inches, which is the result of an error in reading the instructions!]

- In a ten-inning baseball game that the home team loses, the total number of outs recorded by both sides is **60**

- The outstanding achievement whereby an individual player scores **60** or more points in an American (NBA) professional basketball game has been accomplished, within experimental error, **60** times

- For international track competitions, the *shortest* event is the **60** meter dash

- A long-running newsmagazine show on the CBS network is called “**60** Minutes”

- In a game called “*Trivial Pursuit*” that the family likes to play, the goal is to collect six wedge-shaped “pies” and arrange them into a complete circle. Since the total number of degrees in a circle is 360° , the angle from each pie is $\mathbf{60^\circ}$

- In a game called *Chinese checkers*, the total starting number of marbles is **60**



- When playing a game of “*Scrabble*”, the *lowest* number of points that you can get on a move that uses all seven of your tiles is **60**

- In Hebrew numerals, **60** corresponds to the letter *Samekh*, the first letter of the Hebrew word *simcha*, which means “joy” – and can also refer to any festive occasion, such as an anniversary that you are currently celebrating



- The word “*Sabbath*” occurs exactly **60** times in the *New Testament*

- The number **60** occurs exactly once in the *Koran*
- In the *Bible*, specifically in the Song of Songs, it is stated that **60** valiant knights surround Solomon
- *Latitude* and *longitude* are measured in degrees. A degree is divided into **60** minutes [one minute = one nautical mile – slightly longer than a regular mile – along a latitude arc]. Two major European cities at **60°** North latitude are *Helsinki*, Finland and *St. Petersburg*, Russia
- When teaching college-level chemistry classes, an average score of approximately **60** (out of 100) on examinations is considered nearly optimal
- The mirror of a historic giant *telescope* at the Caltech Palomar Observatory, built by George Hale, has a diameter of **60** inches [for perspective, the telescope at the Yerkes Observatory that we visited during our Lake Geneva vacations, also built by Hale, has a diameter of “only” 40 inches]
- A quick-release retractable roll-up *tape measure* that is very handy around a household or laboratory has a length of 5 feet = **60** inches
- A popular current size for plasma high-definition television (*HDTV*) screens measures **60** inches (diagonal)
- The best current *digital cameras* are rated **60** megapixel – this makes it possible to print photographs on letter-sized paper with the same resolution as with film
- A *temperature scale* developed by Rømer, which preceded (and influenced) the work of Fahrenheit, set the boiling point of water as **60** degrees
- *Sound* intensity (loudness) is measured by a logarithmic scale known as decibels (dB). A normal conversation occurs at **60** dB, whereas double that, i.e., 120 dB, is a deafening jet engine roar – restated, a jet is one million (10^6) times louder than a normal conversation
- In the current United States Senate, **60** votes are needed to break a *filibuster*
- A commonly posted highway *speed limit* is **60** miles per hour (which, of course, is 1 mile per minute)
- According to laws in some of the United States, unionized workers are paid at a regular salary for 40 hours per week; then time-and-a-half; and finally double once their work exceeds **60** hours per week [of course, in our family, that would be considered an “easy” week!]



- According to laws in some of the United States, child passenger safety seats are required until a weight of **60** pounds is reached; above that weight, safety belts are considered adequate
- In the practice of law, it is required to give **60 day notice** of intention to terminate (breach) a lease or a contract, thus giving the other side a chance to respond or act
- Farmers collect grains by the *bushel*, and a bushel of wheat weighs **60** pounds
- An *aquarium* for home or school with dimensions 48 3/8" x 12 7/8" x 23 7/8" holds **60** gallons of water – and who can say how many fish
- The largest shark that ever lived was the ferocious *megalodon shark*, an awesome **60** feet, larger even than a modern sperm whale
- On average, the city of Miami, Florida collects about **60** inches of *rain* per year
- Synchronized with the year the two of you became one, the *North Atlantic Treaty Organization* (NATO) has been in existence now for **60** years
- The most famous performance art conservatory in New York City, the *Juilliard* School, is located at **60** Lincoln Center Plaza
- The first *Roman triumvirate*, consisting of Julius Caesar, Pompey the Great, and Marcus Licinius Crassus, was formed in the year **60** B.C.
- The first *London Bridge* was built in the year **60** A.D.
- In **1660**, Isaac Barrow, Newton's teacher, published an English edition of Euclid's "*Elements*", which was the first volume to present the theorems with the help of algebraic notation
- With your two small sons, you emigrated to the United States in **1960**
- You have been married for **60** years!!!!



*HAPPY ANNIVERSARY
FROM YOUR
LOVING FAMILY*