



## Great Pyramid of Giza

The **Great Pyramid of Giza** is the oldest of the Seven Wonders of the Ancient World and the only one that is still in its original form. It

is believed to have been built in less than 20 years around 2560 BC. It is currently 138.8 metres (455.4 feet) tall and for almost 4000 years was the tallest man-made structure. Its original height was 146.5 metres and is less now due to erosion and the absences of the pyramidion.



The inside of the Pyramid contains at least three chambers. Most pyramids were built as tombs for the Kings or Pharaohs of Egypt. Each side of the square base of the Pyramid is 230.4 metres (755.9 ft) long.

The pyramid is estimated to consist of 2.3 million blocks of limestone. The measurements of the builders were so accurate that the average difference between the lengths of the four sides is calculated to be only 58 millimetres. It is debated by historians whether the pyramids were built by slave labour or skilled workers. Some think that two gangs of 100,000 built the pyramid and there is also argument over whether the blocks were dragged, rolled or lifted into place. Whichever method was used, its construction and durability make it indeed a worthy man-made wonder of the world.

### Some Questions about the Pyramid

1. The Great Pyramid of Giza is one of the original Seven Wonders of the Ancient World. Find out the names and locations of the other six.
2. Calculate the current volume of the Pyramid ( in  $m^3$  to nearest thousand).
3. Given that the density of limestone used to build the pyramids was around  $2750 \text{ kg}/m^3$  , what would have been the average weight of each block used.
4. Find out what the pyramidion is.
5. Calculate the ratio of the perimeter to the original height and comment on your answers.
6. What was the **percentage** error for the average difference in the lengths of the sides of the Pyramid.

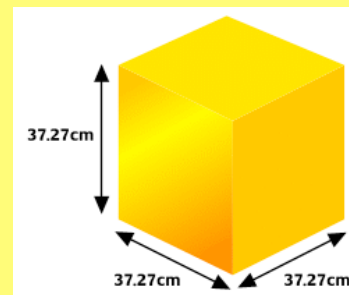
Answers at bottom of Page 2

### Numbers in the News

The price of **gold** tumbled over the past few weeks. It is still around NZ\$1694 per Troy ounce.

Gold is traditionally weighed in Troy ounces (31.1035 grams). With the density of gold at  $19.32 \text{ g}/\text{cm}^3$ , a Troy ounce of gold would have a volume of  $1.64 \text{ cm}^3$ .

A tonne of gold (shown below) would therefore have a volume of  $51,760 \text{ cm}^3$ , which would be equivalent to a cube of side 37.27cm. Therefore 1 gram of gold is the same as 0.0321507 Troy ounces, so 1 kg of gold would be 32.15 Troy ounces.



**Problem** What is the value of this one tonne cube of gold at the current value of gold?

Answer next edition.

### Number Quiz

1. What are prime numbers between 40 and 50?
2. What is the 10th square number?
3. Give 1.9099 to 3 decimal places.
4. Write one million in standard form.
5. What is a quarter of a quarter?

Answers at bottom of Page 2

## Exam Question Challenge

in 2005, there were 9 million bicycles in Beijing, correct to the nearest million. The average distance travelled by each bicycle in one day was 6.5 km, measured correct to one decimal place. Work out the upper bound for the **total** distance travelled by all the bicycles in one day.

Prize for first correct solution (with working). Send to [ro@bestmaths.net](mailto:ro@bestmaths.net)

## The Maths Joke

### Question:

How do you make the **odd** number 7, **even**?

**Answer** Take away the "s"



Spot the mathematical shapes in this building.

## BestMaths News

Our first iPad game **Number Nightmare** is now available from the **Apple App Store**.

Our first eBook **Basic Number Theory and Sets** is also available from the **Apple Book Store**  
**IGCSE Tester** available also **now** in the **Apple App Store**.

Full details at [www.bestmaths.net](http://www.bestmaths.net)

## Formula of the Month

The Volume of a Pyramid

$$V = \frac{1}{3} \times \text{Area of base} \times \text{height}$$

## Answer to last month's Exam Question Challenge

Find the volume.

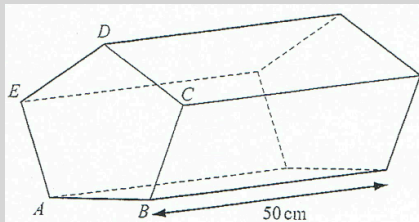


Diagram 1

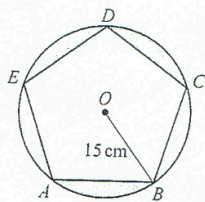


Diagram 2

Area of triangle AOB =  $0.5 \times 15 \times 15 \times \sin 72^\circ = 107 \text{ cm}^2$  (to 3 s.f.)

Area of cross-section (pentagon) =  $5 \times 107 = 535 \text{ cm}^2$  (to 3 s.f.)

Volume of object = (area of cross section)  $\times$  length  
=  $535 \times 50 \text{ cm}^3 = 26750 \text{ cm}^3$

## Special Number 20

**20** is the sum of the first four **triangle numbers** {1, 3, 6, 10}.

**20** is the number of sides in an **icosagon**.

A **dodecahedron**, a 12-faced polyhedron, has **20** vertices (each face is a **pentagon**).

## Last month's The Family Problem

In a family, a boy has as many sisters as brothers, but each sister has only half as many sisters as brothers. How many boys and girls are there in the family?

### Answer

There would be 4 boys and 3 girls.

## Answers to Some questions about the Pyramid

1. Visit [http://en.wikipedia.org/wiki/Seven\\_Wonders\\_of\\_the\\_Ancient\\_World](http://en.wikipedia.org/wiki/Seven_Wonders_of_the_Ancient_World)
2. Volume = 2,456,000 m<sup>3</sup>
3. Average weight = 2937 kg
4. The uppermost piece or capstone of a pyramid
5. 6.291 very close to  $2\pi$
6. 0.025%

## Answers to Number Quiz

1. 41, 43, 47
2. 100
3. 1.910
4.  $1.0 \times 10^6$
5. 1/16

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