

# SOAL DAN KUNCI SIAP UTN PLPG 2017 BIDANG STUDI MATEMATIKA

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### Soal dan Kunci Siap Ujian Tulis Nasional (UTN) Pendidikan Profesi Guru (PPG) 2017 Bidang Studi Matematika

Ujian Tulis Nasional (UTN) PPG merupakan salah satu persyaratan yang harus dipenuhi oleh calon guru untuk memperoleh Sertifikat Profesi Guru (SPG). Pada tahun 2017, UTN PPG juga diselenggarakan untuk bidang studi Matematika. Guna mempersiapkan peserta ujian, berikut disajikan beberapa soal dan kunci jawabannya.

#### Soal 1

Tentukan nilai limit berikut:

$$\lim_{x \rightarrow 2} \frac{x^2 - 4}{x - 2}$$

**Jawaban:** 4

#### Soal 2

Carilah persamaan garis singgung pada grafik fungsi  $y = x^3 - 2x^2 + 1$  di titik  $(1, 0)$ .

**Jawaban:**  $y = 3x - 2$

#### Soal 3

Diketahui matriks  $A = \begin{bmatrix} 2 & -1 \\ 1 & 3 \end{bmatrix}$ . Tentukan nilai invers matriks A jika ada.

**Jawaban:**  $\begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$

#### Soal 4

Sebuah limas tegak memiliki alas berbentuk persegi panjang dengan panjang 12 cm dan lebar 8 cm. Jika tinggi limas 10 cm, tentukan volume limas tersebut.

**Jawaban:** 480 cm<sup>3</sup>

#### Soal 5

Suatu kegiatan ekstrakurikuler diikuti oleh 70 siswa. Di antara siswa tersebut, 40 siswa mengikuti ekstrakurikuler basket, 35 siswa mengikuti ekstrakurikuler voli, dan 15 siswa mengikuti keduanya. Berapa jumlah siswa yang tidak mengikuti kedua ekstrakurikuler tersebut?

**Jawaban:** 15 siswa

### The Severed Tower: Conquering Earth 2

"The Severed Tower: Conquering Earth 2" is a science fiction novel written by J.B. Mitchell. The novel follows the story of a group of survivors who must fight to survive after an alien invasion.

#### 1. What is the main plot of "The Severed Tower"?

The main plot of "The Severed Tower" is that a group of survivors must fight to survive after an alien invasion. The aliens have conquered Earth 2 and are enslaving the human population. The survivors must find a way to defeat the aliens and retake their planet.

#### 2. Who are the main characters in "The Severed Tower"?

The main characters in "The Severed Tower" are:

- **John:** A young man who is struggling to survive in the post-apocalyptic world.
- **Mary:** A woman who is fighting against the alien invasion.

- **Tom:** A scientist who is working on a way to defeat the aliens.

### 3. What are the themes of "The Severed Tower"?

The themes of "The Severed Tower" include:

- **Survival:** The novel explores the themes of survival and resilience in the face of adversity.
- **Hope:** The novel shows that even in the darkest of times, there is always hope.
- **Sacrifice:** The novel shows that sometimes, great sacrifices must be made in order to achieve victory.

### 4. How is "The Severed Tower" different from other science fiction novels?

"The Severed Tower" is different from other science fiction novels in that it focuses on the human element of the story. The novel explores the characters' thoughts and feelings as they struggle to survive in the face of adversity.

### 5. What is the overall message of "The Severed Tower"?

The overall message of "The Severed Tower" is that resilience is the key to overcoming adversity. The human spirit is unyielding, and no matter how difficult the circumstances, we can always find a way to survive.

### What are the main physics formulas?

**How to remember the formulas of physics class 11?** Over time, as you solve more problems, you will automatically remember the formulas. Make notes of the important formulas and stick them up on your wall or even beside a mirror. Writing formulas down physically helps with memory and seeing them visually in your space will reinforce your memory.

### What are all the formulas of class 9 physics?

**What is the formula for motion in physics chapter?** The three equations are,  $v = u + at$ ,  $v^2 = u^2 + 2as$ ,  $s = ut + \frac{1}{2}at^2$

**What is the hardest physics formula?** The hardest general equation to arrive at is perhaps the relativistic mass-energy equation  $E = m_0 c^2 / \sqrt{1 - v^2/c^2}$ . The hardest specific equations to solve are perhaps the nonlinear Schrodinger equations or nonlinear soliton equations, such as  $i\hbar \psi_t = -\hbar^2 \psi_{xx} + |\psi|^2 \psi$ .

**What are the big 5 physics equations?** The 5 major kinematic quantities are displacement ( $x-x_0$ ), time ( $t$ ), initial velocity ( $v_0$ ), final velocity ( $v$ ), and constant acceleration ( $a$ ). These quantities are commonly included when describing the position and motion of an object.

**What is the easiest way to learn physics formulas?**

**What is the fastest way to memorize formulas?**

**How to remember all the formulas in physics class 12?**

**What does r stand for in physics?**

**What are the 4 main equations in physics?**

**What is the most fundamental physics equation?** Possibly the most well known physics equations has to do with energy:  $E=mc^2$ . In this equation, E stands for energy, m for mass, and c for the speed of light in a vacuum (about 186,000 miles/second or  $3 \times 10^8$  meters/second. This equation was developed by the scientist, Albert Einstein.

**What are the basic formulas for physics?**

**What is the formula for force in physics class 11?** For a constant mass, force equals the mass times acceleration, i.e.  $F = m \times a$ .

**What does "u" stand for in physics?** The letter u is used in physics to denote the sign of potential energy, as well as the initial velocity and the object distance in ray optics.

**What is the number 1 rule of physics?** Newton's first law states that if a body is at rest or moving at a constant speed in a straight line, it will remain at rest or keep

moving in a straight line at constant speed unless it is acted upon by a force.

**What is the most famous formula in physics?** The equation  $E = Mc^2$  is perhaps the most famous equation of twentieth- century physics. It is a statement that mass and energy are two forms of the same thing, and that one can be converted into the other (ibid., p.

**What is the longest formula in physics?** The Lagrangian is a mathematical formula used in physics to describe the dynamics of a system. In layman's terms, it tells us how the different particles and...

**What is the most complicated physics equation?** The Navier-Stokes equations are considered as very hard physics equations and so mathematically challenging. The Clay Mathematics Institute chose it as one of seven “Millennium Prize Problems” endowed with a \$1 million reward.

**What is the big Q in physics?** Big Q represents the source charge which creates the electric field. Little q represents the test charge which is used to measure the strength of the electric field at a given location surrounding the source charge. Give considerable attention to the charge quantity - Q or q - being used in each equation.

**What are the prettiest physics equations?**

**What are the 4 main equations in physics?**

**What is the most popular physics formula?** The equation  $E = Mc^2$  is perhaps the most famous equation of twentieth- century physics. It is a statement that mass and energy are two forms of the same thing, and that one can be converted into the other (ibid., p.

**What are the three formulas in physics?**

**What are the 4 fundamentals of physics?** These four basic forces are known as fundamental because they alone are responsible for all observations of forces in nature. The four fundamental forces are gravity, electromagnetism, weak nuclear force, and strong nuclear force.

**The Stone Skeleton: Structural Engineering of Masonry Architecture**

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### **What is a stone skeleton?**

A stone skeleton is the load-bearing structure of a masonry building. It consists of arches, vaults, and pillars that transfer the weight of the building to the ground. The stone skeleton is typically made of stone, brick, or concrete.

### **How does a stone skeleton work?**

A stone skeleton works by transferring the weight of the building to the ground through a series of arches, vaults, and pillars. The arches and vaults distribute the weight of the building evenly over the pillars, which then transfer the weight to the ground. The stone skeleton is able to support a great deal of weight because of the strength of the arches and vaults.

### **What are the advantages of a stone skeleton?**

A stone skeleton has several advantages over other types of building structures. First, it is very strong and durable. Stone is a very hard material that can withstand a lot of weight and stress. Second, a stone skeleton is fireproof. Stone does not burn, so a stone building is unlikely to be damaged by fire. Third, a stone skeleton is relatively easy to build. Stone is a relatively common material, and it can be easily cut and shaped into the desired shapes.

### **What are the disadvantages of a stone skeleton?**

A stone skeleton also has some disadvantages. First, it is very heavy. Stone is a very dense material, so a stone building can be very heavy. Second, a stone skeleton is expensive to build. Stone is a relatively expensive material, and it can take a long time to build a stone building. Third, a stone skeleton is not very flexible. Stone is a brittle material, so it can be easily damaged by earthquakes or other natural disasters.

### **Is a stone skeleton still used today?**

Stone skeletons are still used in some buildings today, but they are not as common as they once were. Modern construction methods have made it possible to build buildings with lighter and more flexible structures. However, stone skeletons are still used in some buildings, such as churches and other historical buildings.

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