

# EINSTEIN IN MATRIX FORM EXACT DERIVATION OF THE THEORY OF SPECIAL AND GENERAL

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**What is the derivation of Einstein special relativity?** When you go through the derivation of Special Relativity relations by Einstein, you discover that it starts with motion of a light signal and the relations are arrived at by equating its distance/time ratios in the two frames — stationary and moving — to a constant i.e. speed of light in vacuum  $c$ .

**What is Albert Einstein's theory of general relativity?** Einstein's 1915 general theory of relativity holds that what we perceive as the force of gravity arises from the curvature of space and time. The scientist proposed that objects such as the sun and the Earth change this geometry.

**What are the two postulates from which Einstein developed the special theory of relativity?** The first postulate of special relativity is the idea that the laws of physics are the same and can be stated in their simplest form in all inertial frames of reference. The second postulate of special relativity is the idea that the speed of light  $c$  is a constant, independent of the relative motion of the source.

**What math did Einstein use for general relativity?** A version of non-Euclidean geometry, called Riemannian geometry, enabled Einstein to develop general relativity by providing the key mathematical framework on which he fit his physical ideas of gravity. This idea was pointed out by mathematician Marcel Grossmann and published by Grossmann and Einstein in 1913.

**What was Einstein's special theory of relativity?** Einstein went on to present his findings mathematically: energy ( $E$ ) equals mass ( $m$ ) times the speed of light ( $c$ ) squared ( $2$ ), or  $E=mc^2$ . The secret the equation revealed—that mass and energy are different forms of the same thing—had eluded scientists for centuries.

**Is  $E=mc^2$  special or general relativity?**  $E=mc^2$ , equation in German-born physicist Albert Einstein's theory of special relativity that expresses the fact that mass and energy are the same physical entity and can be changed into each other.

**What is the theory of relativity in layman's terms?** Basically, relativity said that the laws of physics couldn't depend on how fast you were moving; all you could measure was the velocity of one object relative to another.

**What is Einstein's most famous theory?** general theory of relativity changed our understanding of space and time, becoming one of the two pillars of modern physics – the other being quantum mechanics.

**What is the difference between general relativity and special relativity?** Relativity is two related theories: special relativity, which explains the relationship between space, time, mass, and energy; and general relativity, which describes how gravity fits into the mix. Albert Einstein proposed these theories starting in 1905. By the 1920s, they were widely accepted by physicists.

**How did Einstein come up with the theory of relativity?** Einstein developed the idea in one of his best known thought experiments. He asked us to imagine a physicist who awakens in a box. Unknown to the physicist, the box is in a distant part of the space of special relativity and is being accelerated uniformly in one direction by the tug of some agent.

**What is one way to state Einstein's special relativity theory?** Einstein's special theory of relativity states that the same laws of physics hold true in all inertial reference frames and that the speed of light is the same for all observers, even those moving with respect to one another.

**What is the theory of relativity for dummies?** The principle of relativity: The laws of physics don't change, even for objects moving in inertial (constant speed) frames of reference. The principle of the speed of light: The speed of light is the same for all

observers, regardless of their motion relative to the light source.

**What did Nikola Tesla think of Einstein's theory of relativity?** Tesla criticized certain aspects of relativity theory and expressed skepticism about the concept of curved spacetime. He believed that the theories of electromagnetism he had developed, such as his own theory of gravitation, were more accurate and had a deeper understanding of the fundamental workings of the universe.

**Why do we need tensors in general relativity?** Tensor fields in general relativity The notion of a tensor field is of major importance in GR. For example, the geometry around a star is described by a metric tensor at each point, so at each point of the spacetime the value of the metric should be given to solve for the paths of material particles.

**What math is required for relativity?** General relativity is a profound generalisation of special relativity which incorporates gravity. The mathematical description of general relativity requires the mathematical language of differential geometry which uses the notions of metric, connection and curvature, which will be introduced from scratch.

**How was Einstein's equation derived?** The Einstein field equations can be derived from the Bianchi identity by postulating that curvature and matter should be related. However, a more modern approach for deriving the field equations is from the Einstein-Hilbert action by using the principle of least action.

**Is there any derivation of  $E = mc^2$ ?** Abstract – Einstein's 1905 derivation of  $E = mc^2$  has been criticized for being circular. Although such criticism have been challenged it is certainly true that the reasoning in Einstein's original derivation is not at all obvious. Einstein's original derivation could be been made clearer.

**How did they prove special relativity?** The predictions of special relativity have been confirmed in numerous tests since Einstein published his paper in 1905, but three experiments conducted between 1881 and 1938 were critical to its validation. These are the Michelson–Morley experiment, the Kennedy–Thorndike experiment, and the Ives–Stilwell experiment.

**Who derived the special theory of relativity?** Einstein first published his Special Theory of Relativity—which describes his revolutionary ideas about light, time and energy—in 1905.

## **The Business Model Navigator: 55 Models to Revolutionize Your Business**

**Introduction** In today's competitive business landscape, innovation and adaptability are key to success. The Business Model Navigator provides a comprehensive toolkit of 55 business models that can empower companies to transform their operations and achieve growth.

**Question 1: What is the Business Model Navigator?** Answer: The Business Model Navigator is a compendium of 55 business models, each presenting a unique approach to generating revenue, delivering value, and creating sustainable competitive advantage.

**Question 2: How can companies use the Business Model Navigator?** Answer: By studying the different models, businesses can identify new ways to improve their customer experience, optimize operations, and disrupt their industry. It provides a framework for exploring alternative business structures, revenue streams, and value propositions.

**Question 3: What are some examples of business models in the Navigator?** Answer: The Navigator includes models such as the subscription model (e.g., Netflix), the freemium model (e.g., Spotify), the platform model (e.g., Airbnb), and the razor-and-blade model (e.g., Gillette). Each model offers insights into how businesses can differentiate themselves and create value for customers.

**Question 4: How does the Business Model Navigator help businesses innovate?** Answer: The Navigator acts as a catalyst for innovation by sparking ideas and challenging conventional thinking. It encourages companies to experiment with different models, test new revenue streams, and explore new markets.

**Question 5: What is the impact of using the Business Model Navigator?** Answer: By embracing the Business Model Navigator, businesses can gain a deeper understanding of their own business model, identify opportunities for growth, and adapt to evolving market conditions. It provides a valuable tool for entrepreneurs, startups, and established companies alike to explore new possibilities and drive innovation.

investors, and business leaders seeking to revolutionize their industry and achieve sustained success.

**What are the best quotes from The Wisdom of Insecurity?** To remain stable is to refrain from trying to separate yourself from a pain because you know that you cannot. Running away from fear is fear, fighting pain is pain, trying to be brave is being scared. If the mind is in pain, the mind is pain. The thinker has no other form than his thought.

**What is the wisdom of insecurity about?** Brief summary The Wisdom of Insecurity by Alan Watts explores the paradox of trying to find security in an uncertain world. It challenges readers to embrace the present moment instead of constantly seeking for a better future, offering a new perspective on the nature of existence.

**Is The Wisdom of Insecurity a good book?** Search for security is the fundamental problem from which arises our insecurity. " This book is another gem from Alan Watts, and is as enlightening as his other works. Highly Recommended!

**What was Alan Watts' main message?** He spoke of harmony, and his life reveals that he practiced what he preached. Beyond the individual, he believed in the importance of social ethics to lead to spiritual realization within the inner self. His ideology revolved around communal ideals and reached far beyond himself as one human being.

**What was Alan Watts' famous quote?** No work or love will flourish out of guilt, fear, or hollowness of heart, just as no valid plans for the future can be made by those who have no capacity for living now. But the attitude of faith is to let go, and become open to truth, whatever it might turn out to be.

**What is the root of all insecurity?** The kind of childhood you had, past traumas, recent experiences of failure or rejection, loneliness, social anxiety, negative beliefs about yourself, perfectionism, or having a critical parent or partner can all contribute to insecurity.

**What is the root emotion of insecurity?** Low self-confidence, or insecurity, involves feeling inadequate or not good enough. Everyone experiences it from time to time, but it usually doesn't last forever. Insecurity can stem from a variety of

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factors. These include: childhood experiences, comparison to others, trauma, uncertainty, and discrimination.

**What God says about your insecurities?** 1. We can conquer insecurity the same way we do any temptation of the flesh. 1 Corinthians 10:13 tells us that God will not allow us to “be tempted beyond what you can bear. But when you are tempted, he will also provide a way out so that you can endure it.”

**What is the spiritual root of insecurity?** The root of insecurity is when your identity is built on an insecure foundation.” As I considered what the Holy Spirit said, I felt defensive. “My identity is secured to You, Lord. I know what the Word says about who I am, and I believe it.

**What happens in Chapter 7 of the wisdom of insecurity?** In Chapter VII, “The Transformation of Life,” Watts describes the visionary experience that makes life self-evidently worth living. For him, this consists of the unvarnished understanding that all of reality is an “organic unity” (107), that true separateness is an illusion.

**What book in the Bible talks about insecurity?** Ephesians 6:10-14 11 Put on the full armor of God, so that you can take your stand against the devil's schemes. 12 For our struggle is not against flesh and blood, but against the rulers, against the authorities, against the powers of this dark world and against the spiritual forces of evil in the heavenly realms.

**What is the main message of the wisdom books?** Traditionally, these five books have also been known as Wisdom Literature because of their emphasis on understanding and attaining wisdom for all areas of life, including our relationships with God and with one another.

**What is the paradox of Alan Watts?** Paradoxical as it may seem, the purposeful life has no content, no point. It hurries on and on, and misses everything. Not hurrying, the purposeless life misses nothing, for it is only when there is no goal and no rush that the human senses are fully open to receive the world.

**What kind of person was Alan Watts?** Although Watts had a reputation as an enlightened thinker, he was not without his share of emotional and psychological problems. He was a well-known chain-smoker and heavy drinker; he was also an

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adulterer and a self-described neglectful father to his several children.

**Is Alan Watts enlightened?** Alan Watts was enlightened. having or showing a rational, modern, and well-informed outlook. spiritually aware.

### **Tenses Exercise with Answers**

Tenses are grammatical constructs that indicate the time of an action or event. They play a crucial role in expressing the sequencing of events and the relationships between them. This exercise provides a set of questions and answers to help you practice and improve your understanding of tenses.

#### **Question 1:**

Identify the tense of the verb "write" in the following sentence:

I am writing a letter.

#### **Answer:**

Present continuous tense

#### **Question 2:**

Complete the sentence with the correct form of the verb "can" in the past tense:

I \_\_\_ swim when I was younger.

#### **Answer:**

could

#### **Question 3:**

Change the following sentence to the past perfect tense:

She will finish the project.

#### **Answer:**

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She would have finished the project.

**Question 4:**

Identify the tense of the verb "work" in the following sentence:

The children are playing outside.

**Answer:**

Present continuous tense

**Question 5:**

Complete the sentence with the correct form of the verb "be" in the future perfect tense:

By the time we arrive, they \_\_\_\_\_ already left.

**Answer:**

will have

**Paragraph 2:**

**Question 6:**

Identify the tense of the verb "eat" in the following sentence:

I ate lunch earlier.

**Answer:**

Past simple tense

**Question 7:**

Complete the sentence with the correct form of the verb "have" in the present perfect continuous tense:

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I \_\_\_ been studying for hours.

**Answer:**

have been

**Question 8:**

Change the following sentence to the future perfect tense:

I will clean the house.

**Answer:**

I will have cleaned the house.

**Question 9:**

Identify the tense of the verb "go" in the following sentence:

We went to the park yesterday.

**Answer:**

Past simple tense

**Question 10:**

Complete the sentence with the correct form of the verb "do" in the present perfect continuous tense:

What \_\_\_ you been doing all day?

**Answer:**

have you been

**Paragraph 3:**

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**Question 11:**

Identify the tense of the verb "play" in the following sentence:

They are playing soccer now.

**Answer:**

Present continuous tense

**Question 12:**

Complete the sentence with the correct form of the verb "be" in the past perfect continuous tense:

I \_\_\_ been waiting for you.

**Answer:**

had been

**Question 13:**

Change the following sentence to the future perfect continuous tense:

I will study for the exam.

**Answer:**

I will have been studying for the exam.

**Question 14:**

Identify the tense of the verb "walk" in the following sentence:

I walked to school last week.

**Answer:**

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Past simple tense

**Question 15:**

Complete the sentence with the correct form of the verb "know" in the present perfect continuous tense:

I \_\_\_ him since we were kids.

**Answer:**

have known

**Paragraph 4:**

**Question 16:**

Identify the tense of the verb "sleep" in the following sentence:

I was sleeping when the phone rang.

**Answer:**

Past continuous tense

**Question 17:**

Complete the sentence with the correct form of the verb "have" in the past perfect continuous tense:

They \_\_\_ been reading for a long time.

**Answer:**

had been

**Question 18:**

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Change the following sentence to the future perfect continuous tense:

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I will work on this project.

**Answer:**

I will have been working on this project.

**Question 19:**

Identify the tense of the verb "talk" in the following sentence:

We will talk about it tomorrow.

**Answer:**

Future simple tense

**Question 20:**

Complete the sentence with the correct form of the verb "make" in the present perfect continuous tense:

I \_\_\_ dinner for the past hour.

**Answer:**

have been making

**Paragraph 5:**

**Question 21:**

Identify the tense of the verb "live" in the following sentence:

I have lived here for ten years.

**Answer:**

Present perfect tense

**Question 22:**

Complete the sentence with the correct form of the verb "be" in the past perfect continuous tense:

The students \_\_\_ studying for the test.

**Answer:**

had been

**Question 23:**

Change the following sentence to the future perfect continuous tense:

I will learn a new language.

**Answer:**

I will have been learning a new language.

**Question 24:**

Identify the tense of the verb "want" in the following sentence:

I wanted to go to the beach.

**Answer:**

Past simple tense

**Question 25:**

Complete the sentence with the correct form of the verb "study" in the present perfect continuous tense:

I \_\_\_ English for several months.

## Answer:

have been studying

[\*the business model navigator 55 models that will revolutionise your business, the wisdom of insecurity alan watts, tenses exercise with answers\*](#)

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