

Северо – Восточный образовательный округ

Заседание окружного МО учителей математики

28.10. 2021

Методический анализ ОГЭ 2021

random]Plasmid

DNA is a nucleic acid that contains the genetic information of all known living organisms, and some viruses. The main role of DNA molecules is the long-term storage of information. DNA is often compared to a set of instructions or a recipe, or a code, since it contains the instructions needed to construct other components of the cell, such as proteins and RNA molecules. The DNA segments that carry this genetic information are called genes, but other DNA sequences have structural purposes, or are involved in regulating the use of this genetic information.

Chemically, DNA consists of two long polymers of simple units called nucleotides, with phosphate groups joined by ester bonds. These two strands run in opposite directions to each other and are therefore anti-parallel. Attached to each sugar is one of four types of molecules called bases. It is the sequence of these four bases along the backbone that encodes information. This information is read using the genetic code, which specifies the sequence of the amino acids within proteins. The code is read by copying stretches of DNA into the related molecule, messenger RNA, in a process called transcription.

Within cells, DNA is organized into long structures called chromosomes. These chromosomes are duplicated before cells divide, in a process called DNA replication. Eukaryotic organisms (animals, plants, fungi, and protists) store most of their DNA inside the cell nucleus and some of their DNA in organelles, such as mitochondria and chloroplasts. In contrast, prokaryotes (bacteria and archaea) store their DNA only as a single chromosome. Within the chromosomes, chromatin packages DNA into higher-order structures. Chromatin consists of long fibers of nucleosomes, which are segments of DNA that are wrapped around histone proteins. These complex structures provide the structural context between DNA and other proteins, helping control which parts of the DNA are transcribed.

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Соответствие годовых отметок и экзаменационных отметок



random]pLasmlD

Deoxyribonucleic acid (DNA) is a nucleic acid that contains the genetic instructions used in the development and functioning of all known living organisms and some viruses. The main role of DNA molecules is the long-term storage of information. DNA is often compared to a set of blueprints or a recipe, or a code, since it contains the instructions needed to construct other components of the cell, such as proteins and RNA molecules. The DNA segments that carry this genetic information are called genes, but other DNA sequences have structural purposes, or are involved in regulating the use of this genetic information.

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DNA is a double helix structure. The two strands are held together by hydrogen bonds between the nitrogenous bases. The bases are paired: adenine with thymine, and guanine with cytosine. The phosphate groups are attached to the sugar-phosphate backbone. The structure is often compared to a twisted ladder.

The DNA double helix is a right-handed helix. The distance between two consecutive base pairs is approximately 3.4 nanometers. The width of the major groove is approximately 2.2 nanometers, and the width of the minor groove is approximately 1.2 nanometers.

The DNA double helix is a very stable structure. It is able to store information for a long time. The DNA double helix is also able to replicate itself. This is done by the process of DNA replication.

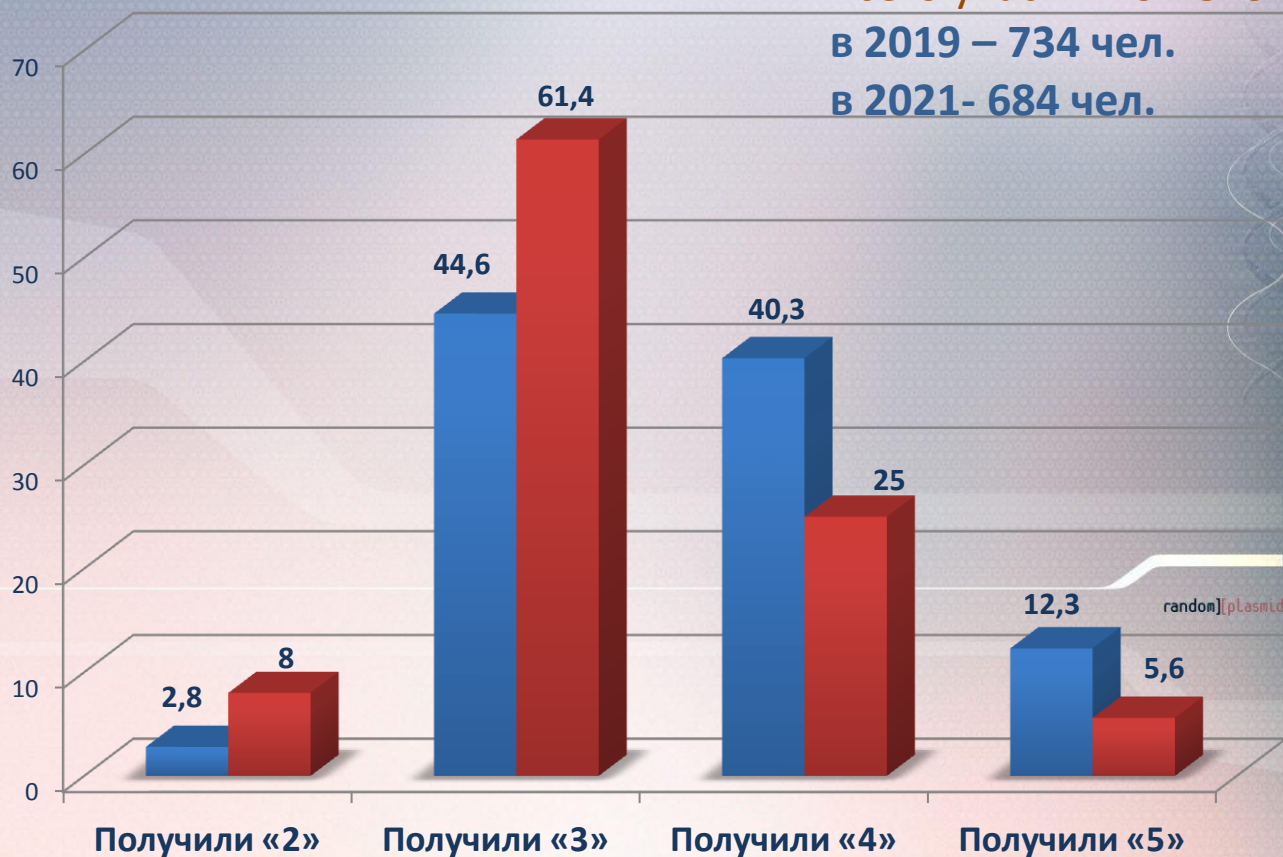
DNA is the genetic material of most organisms. It is a long, thin molecule that is made up of two strands. The strands are held together by hydrogen bonds between the nitrogenous bases. The bases are paired: adenine with thymine, and guanine with cytosine. The phosphate groups are attached to the sugar-phosphate backbone. The structure is often compared to a twisted ladder.

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Динамика результатов ОГЭ по математике (в сравнении с 2019г.)

Всего участников ОГЭ
в 2019 – 734 чел.
в 2021- 684 чел.



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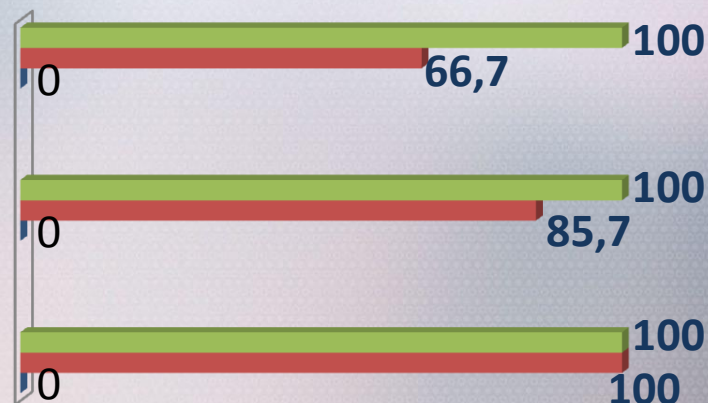
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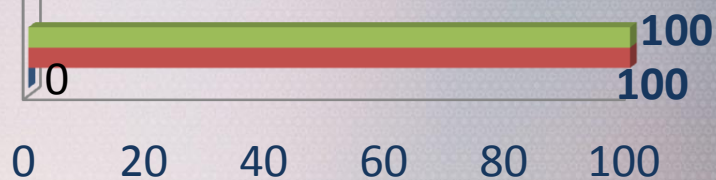
Перечень ОО, продемонстрировавших наиболее высокие результаты ОГЭ по предмету:

с. Новое Ганькино



Лицей экономический

с. Кротково



- Доля участников, получивших отметки «3», «4» и «5» (уровень обученности)
- Доля участников, получивших отметки «4» и «5» (качество обучения)
- Доля участников, получивших отметку «2»

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Перечень ОО, продемонстрировавших наиболее низкие результаты ОГЭ по предмету:

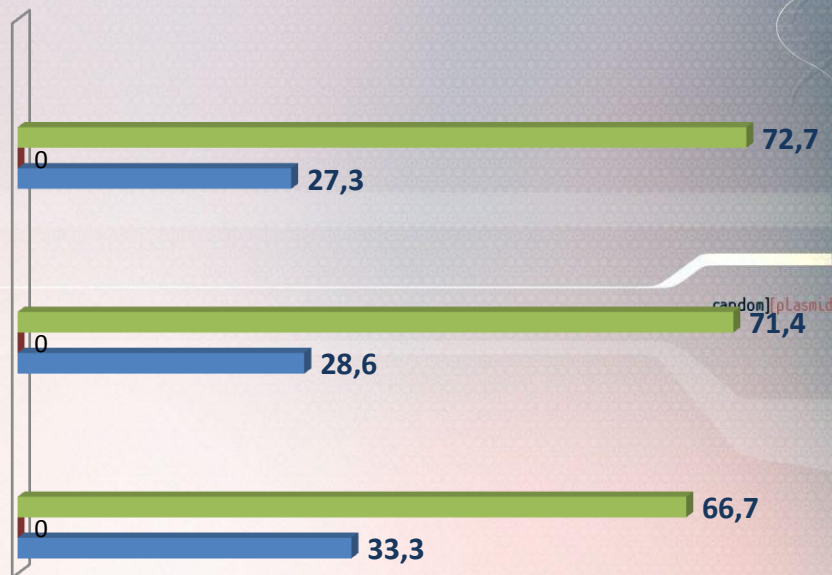
- Доля участников, получивших отметки «3», «4» и «5» (уровень обученности)
- Доля участников, получивших отметки «4» и «5» (качество обучения)
- Доля участников, получивших отметку «2»

№4 города Похвистнево

ООШ

с. Новое Мансуркино

с. Нижнеаверкино

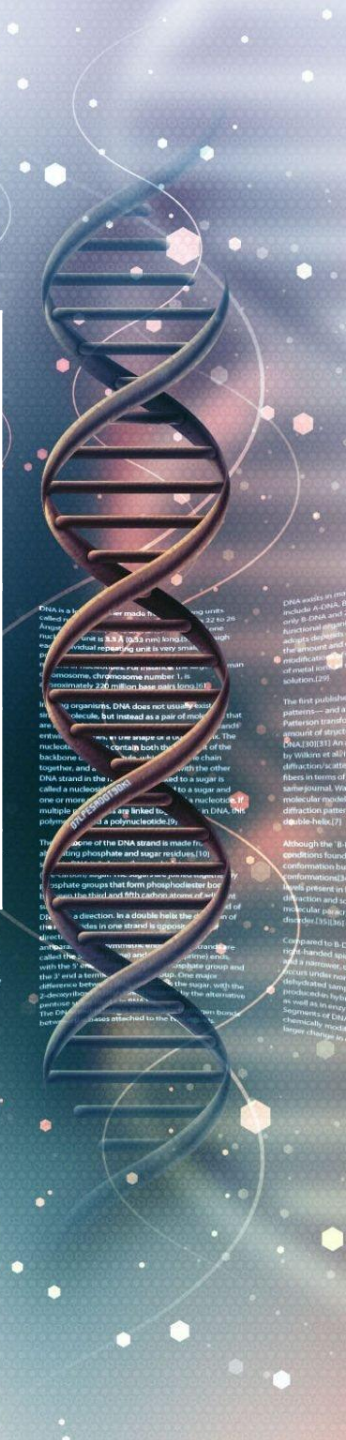


Выводы о характере результатов ОГЭ по математике в 2021г.

	Доля участников, получивших отметку «2»	Доля участников, получивших отметку «3»	Доля участников, получивших отметку «4»	Доля участников, получивших отметку «5»
Региональный показатель	4,2	56,7	31,0	8,1
Окружной показатель	8	61,4	25	5,6
Разница	-3,8	- 8,5	- 6	- 2,5

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Анализ результатов выполнения отдельных заданий

Математика ОГЭ	
Продолжительность экзамена	235 минут
Средства обучения	Линейка, не содержащая справочной информации для построения чертежей и рисунков; справочные материалы, содержащие основные формулы курса математики образовательной программы ООО
Изменения в КИМ ОГЭ 2021	Задание №8 Задание №14 Максимальный первичный балл уменьшен с 32 до 31.

Распределение заданий по частям экзаменационной работы

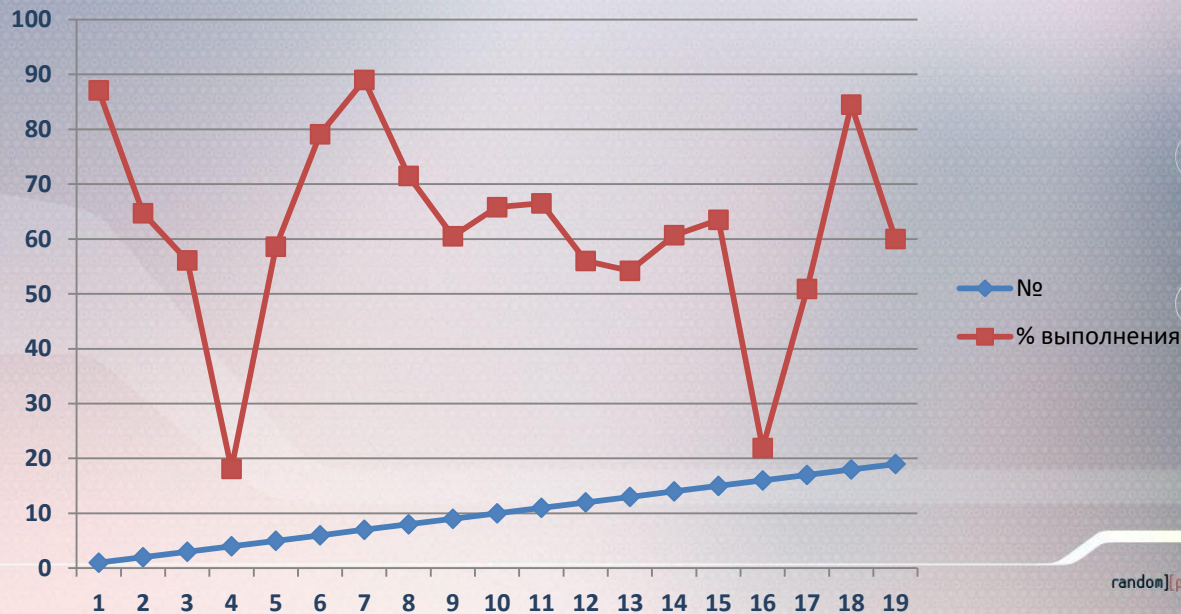
Часть	Кол-во заданий	Особенности	Максимальный первичный балл
I	19	Краткий ответ (цифра, число или последовательность чисел)	19
II	6	Развернутый ответ	12
Итого	25		31

Распределение заданий КИМ по уровням сложности

Уровень сложности задания	Количество заданий	Максимальный первичный балл
Базовый	19	19
Повышенный	4	8
Высокий	2	4
Итого	25	31



Статистический и содержательный анализ выполняемости заданий. Часть 1



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Deoxyribonucleic acid (DNA) is a nucleic acid that contains the genetic instructions used in the development and functioning of all known living organisms and some viruses. The blueprint or recipe, or a code, used to construct the molecules needed to construct other components of cells, such as proteins and RNA molecules. The DNA strands, but other DNA sequences have structural purposes or are involved in regulating the use of this genetic information.

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Within cells, DNA is organized into long structures called chromosomes. These chromosomes are duplicated before cells divide, in a process called replication. Eukaryotic organisms store most of their DNA inside the nucleus, and some of their DNA in organelles, such as mitochondria or chloroplasts. In prokaryotes, all nucleotides (bacteria and archaea) store their DNA only in the cytoplasm. Within the chromosomes, chromatin proteins such as histones compact and organize DNA. These compact, intertwined nucleic acid structures are called chromatin. Chromatin is further packaged to condense DNA and other proteins, forming ordered nucleosomes, which are the basic unit of DNA packaging in eukaryotes. The DNA sequence is held together by hydrogen bonds between complementary DNA strands.

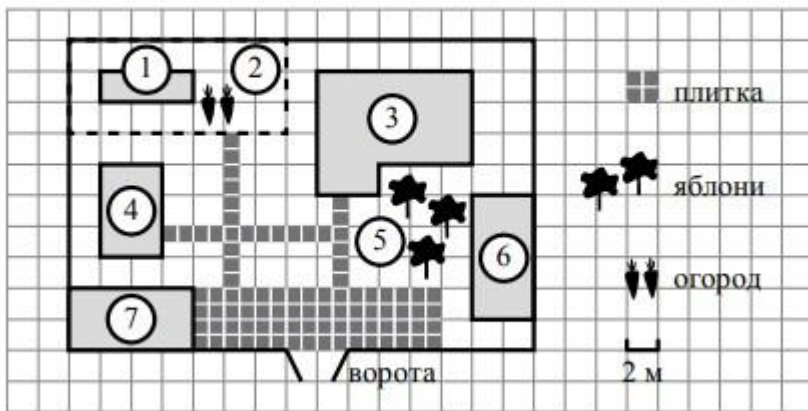
DNA is a long molecule that is made from two strands called the sugar-phosphate backbone. The two strands are held together by hydrogen bonds between the nitrogenous bases. The distance between two adjacent base pairs is approximately 3.4 Å (3.4 x 10⁻¹⁰ m). The length of a DNA molecule is approximately 2.2 m (2.2 x 10⁹ base pairs long).

In eukaryotes, DNA does not usually exist as a single molecule, but instead as a pair of molecules called sister chromatids. The nucleotides in the sugar-phosphate backbone of the two strands are connected to each other by hydrogen bonds. The two strands are held together by hydrogen bonds between the nitrogenous bases. The distance between two adjacent base pairs is approximately 3.4 Å (3.4 x 10⁻¹⁰ m). The length of a DNA molecule is approximately 2.2 m (2.2 x 10⁹ base pairs long).

DNA exists in the form of a double helix. The two strands are held together by hydrogen bonds between the nitrogenous bases. The distance between two adjacent base pairs is approximately 3.4 Å (3.4 x 10⁻¹⁰ m). The length of a DNA molecule is approximately 2.2 m (2.2 x 10⁹ base pairs long).

The first published model of the DNA double helix was proposed by James Watson and Francis Crick in 1953. Their model was based on the work of Rosalind Franklin and Maurice Wilkins, who had discovered the structure of DNA using X-ray diffraction techniques. The Watson-Crick model showed that DNA is a right-handed helix with a major groove and a minor groove. The distance between two adjacent base pairs is approximately 3.4 Å (3.4 x 10⁻¹⁰ m). The length of a DNA molecule is approximately 2.2 m (2.2 x 10⁹ base pairs long).

Прочитайте внимательно текст и выполните задания 1–5.



4 Найдите расстояние от жилого дома до гаража (расстояние между двумя ближайшими точками по прямой) в метрах.

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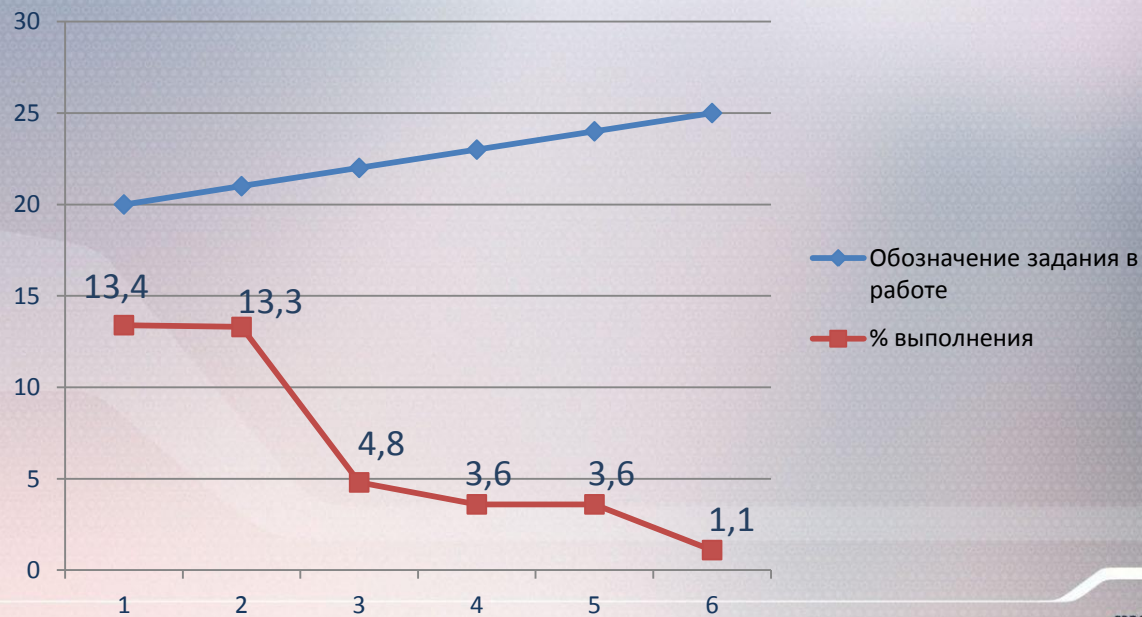
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Within cells, DNA is organized into long structures called chromosomes. These chromosomes are duplicated before cells divide, in a process called DNA replication. Eukaryotic organisms, animals, plants, fungi, and protists store most of their DNA inside cell nuclei or chloroplasts (in eukaryotes), while all prokaryotes (bacteria and archaea) store their DNA only in the cytoplasm. Within the chromosomes, chromatin proteins such as histones compact and organize DNA. These compact, nucleosomal structures are referred to as chromatin, and are further packaged to conceal which parts of the DNA are transcribed.

DNA is a double helix structure. The two strands are antiparallel and are held together by hydrogen bonds between the nitrogenous bases. The bases are attached to the sugar-phosphate backbone of the DNA molecule. The bases are divided into two groups: purines and pyrimidines. Purines are larger and have two rings, while pyrimidines are smaller and have one ring. The bases are connected to the sugar-phosphate backbone by glycosidic bonds. The sugar-phosphate backbone is made of alternating phosphate and sugar molecules. The phosphate groups are linked to the sugar molecules by ester bonds. The sugar molecules are linked to each other by hydrogen bonds. The hydrogen bonds are between the nitrogenous bases of the two strands. The hydrogen bonds are between the complementary bases: adenine with thymine, and guanine with cytosine. The hydrogen bonds are between the bases of the two strands, and they hold the two strands together. The hydrogen bonds are between the bases of the two strands, and they hold the two strands together. The hydrogen bonds are between the bases of the two strands, and they hold the two strands together.

Статистический и содержательный анализ выполняемости заданий. Часть 2



Модуль	Алгебра					Геометрия	
	20	21	22	23	24	25	
Планируемый	30-50	15-30	3-15	30-50	15-30	3-15	
% выполнения							
Реальный % выполнения	9	8	2	2	2	1	

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20 Решите уравнение $x^4 = (4x - 5)^2$.

21 Рыболов в 5 часов утра на моторной лодке отправился от пристани против течения реки, через некоторое время бросил якорь, 2 часа ловил рыбу и вернулся обратно в 10 часов утра того же дня. На какое расстояние от пристани он отплыл, если скорость течения реки равна 2 км/ч, а собственная скорость лодки равна 6 км/ч?

22 Постройте график функции $y = \frac{x^4 - 13x^2 + 36}{(x-3)(x+2)}$ и определите, при каких значениях c прямая $y=c$ имеет с графиком ровно одну общую точку.

23 В прямоугольном треугольнике ABC с прямым углом C известны катеты: $AC = 6$, $BC = 8$. Найдите медиану CK этого треугольника.

24 В параллелограмме $ABCD$ точка E — середина стороны AB . Известно, что $EC = ED$. Докажите, что данный параллелограмм — прямоугольник.

25 Основание AC равнобедренного треугольника ABC равно 12. Окружность радиусом 8 с центром вне этого треугольника касается продолжений боковых сторон треугольника и касается основания AC . Найдите радиус окружности, вписанной в треугольник ABC .



Выводы об итогах анализа выполнения заданий, групп заданий:

- неумение понять суть вопроса, содержание задания, приводящее к построению неверного хода решения;
- недостаточно развитые умения смыслового чтения, не позволяющие построить адекватную математическую модель по условию задания;
- несформированность вычислительных навыков;
- неспособность грамотно сформулировать решение в письменном виде, небрежное оформление письменного решения задачи;
- недостаточные геометрические знания, слабая графическая культура;
- неумение проводить анализ условия задания при решении практических и ситуационных задач, неумение применять известный алгоритм в нестандартной ситуации.

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Рекомендации для учителей по совершенствованию организации и методики преподавания учебного предмета

- рабочая программа
- диагностические работы
- навыки самоконтроля и самопроверки
- уровень вычислительных навыков
- отработка заданий Открытого банка ОГЭ

random]plasmid



Рекомендации по организации дифференцированного обучения обучающихся с разным уровнем предметной подготовки

- со слабо успевающими обучающимися
- для «средних» учеников
- для сильных учеников

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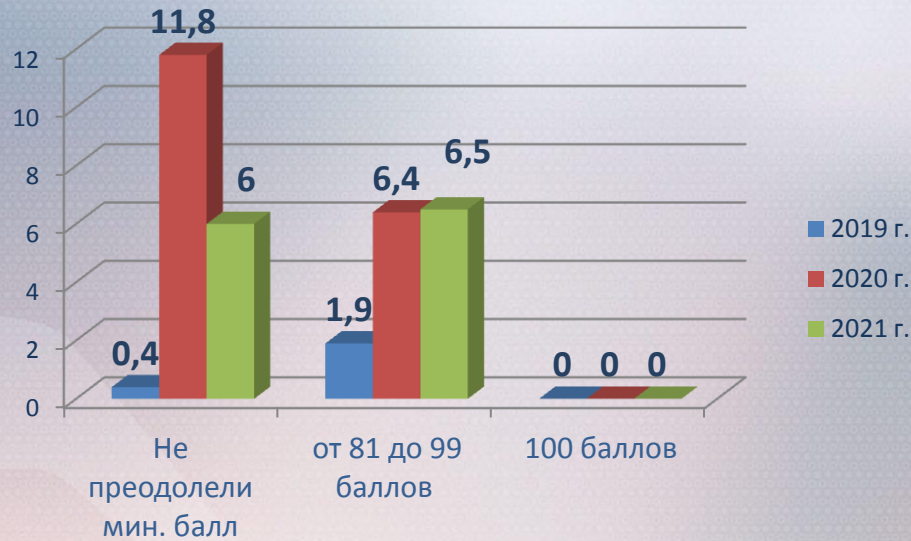
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DNA is a nucleic acid that contains the genetic information used in the development and functioning of all known living organisms and some viruses. The main role of DNA molecules is the long-term storage of information. DNA is often compared to a set of blueprints, or a recipe, or a code, since it contains the instructions needed to construct other components of the cell, such as proteins and RNA molecules. The DNA segments that carry this genetic information are called genes, but other DNA sequences have structural purposes, or are involved in regulating the use of this genetic information.

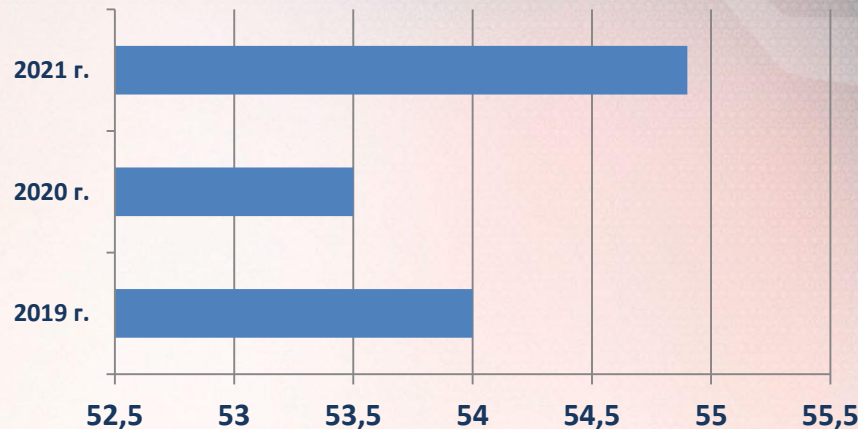
DNA is a double helix. It is made up of two strands that are twisted around each other. The strands are held together by hydrogen bonds between the nitrogenous bases. The backbone of the DNA strand is made of alternating phosphate and sugar residues. The phosphate groups are linked to the sugar residues by phosphodiester bonds. The nitrogenous bases are linked to the sugar residues by hydrogen bonds. The sequence of the bases is the genetic code. The genetic code is read by copying stretches of DNA into the related molecule, mRNA, in a process called transcription.

random]plasmid

Динамика результатов ЕГЭ по математике (за последние 3 года)



Динамика среднего тестового балла



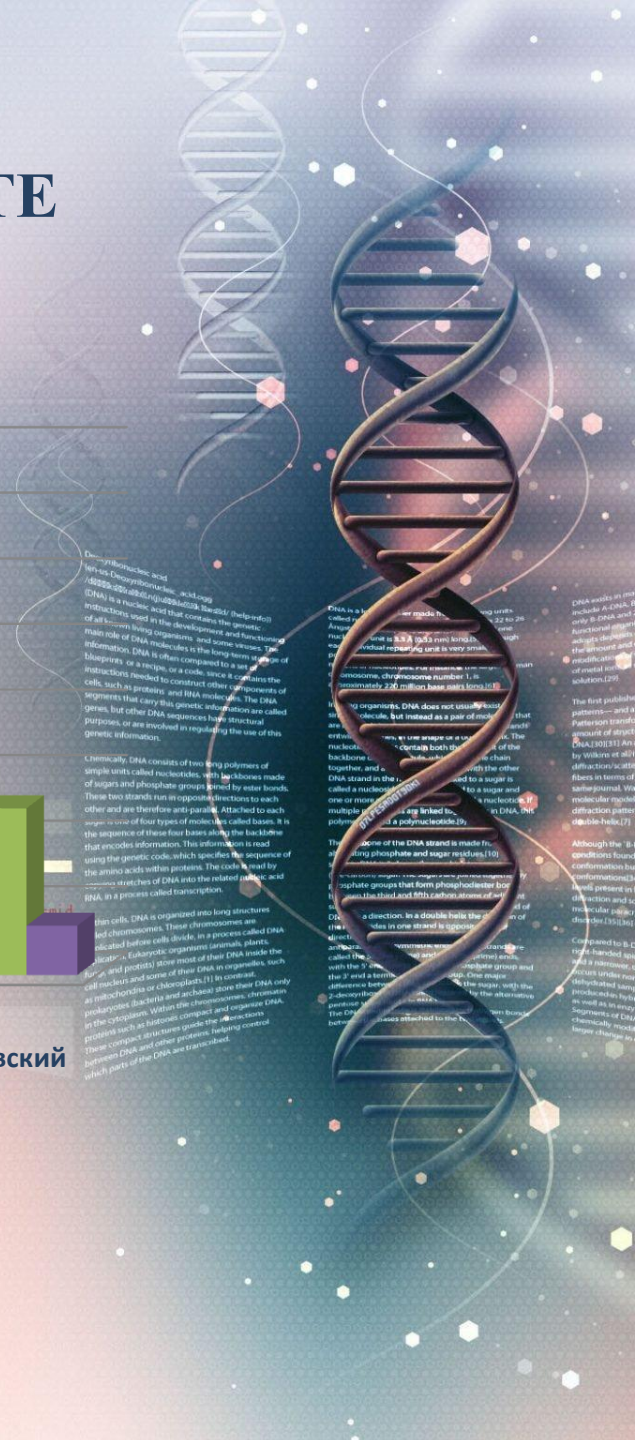
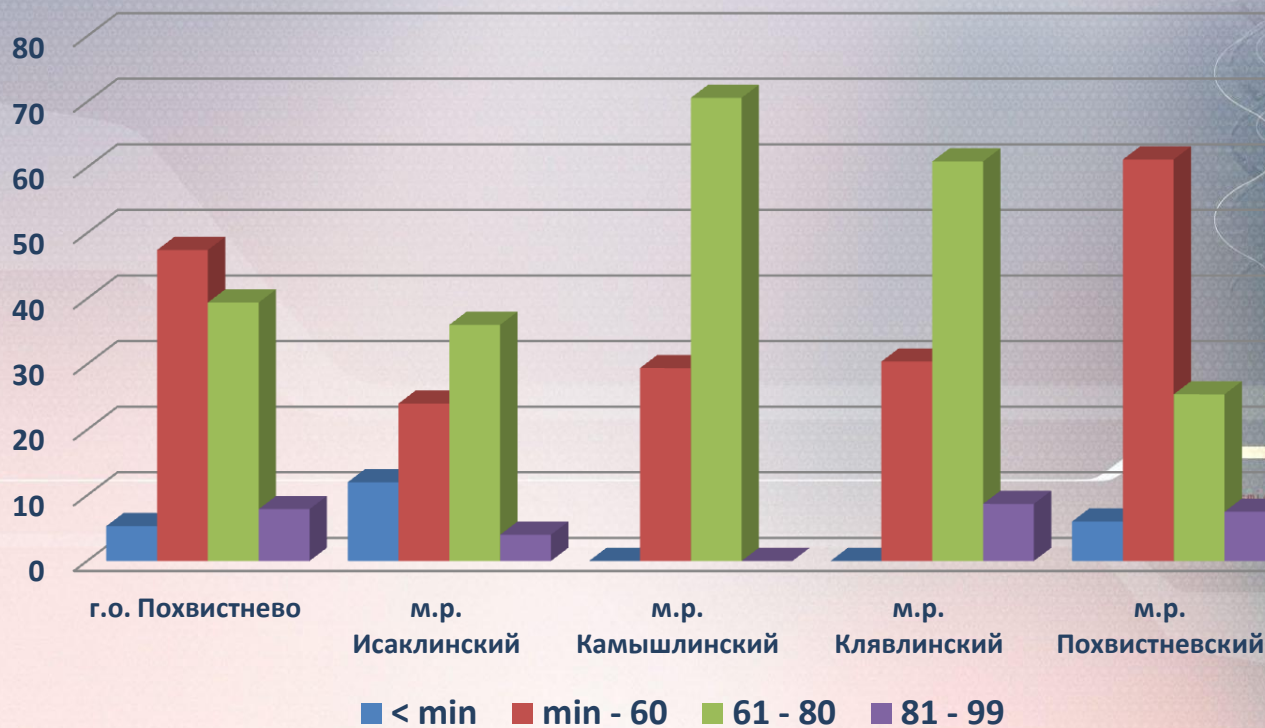
random][p]lasmid

Deoxyribonucleic acid (DNA) is a nucleic acid that contains the genetic instructions used in the development and functioning of all known living organisms and some viruses. The main role of DNA molecules is the long-term storage of information. DNA often exists as a compact, highly ordered structure called a chromosome. In a cell, DNA is organized into long structures called chromosomes. These chromosomes are duplicated before cells divide, in a process called DNA replication. Eukaryotic organisms store their DNA inside the nucleus and some of their DNA in organelles, such as mitochondria or chloroplasts. In contrast, prokaryotes (bacteria and archaea) store their DNA only in the cytoplasm. Within the chromosomes, chromatin proteins such as histones compact and organize DNA. These complex structures provide additional control mechanisms in gene expression, helping control which parts of the DNA are transcribed.

DNA is a long molecule made from repeating units called nucleotides. Each nucleotide contains a phosphate group, a sugar, and a nitrogenous base. The phosphate groups form phosphodiester bonds between the 3' carbon atom of one nucleotide and the 5' carbon atom of the next nucleotide. The nitrogenous bases are attached to the 1' carbon atom of the sugar. In a double helix, the two strands of DNA are twisted around each other. The phosphate groups are attached to the outside of the helix, and the nitrogenous bases are attached to the inside. The two strands are held together by hydrogen bonds between the bases. The bases are paired: adenine with thymine, and guanine with cytosine. The sequence of the bases in a DNA strand is the genetic code, which specifies the sequence of the amino acids within proteins. The code is read by copying stretches of DNA into the related molecule, messenger RNA, in a process called transcription.

Although the conditions found in the laboratory are not the same as those in the cell, the study of DNA has provided a wealth of information about the structure and function of this molecule. The study of DNA has also led to the development of many technologies, including DNA fingerprinting and the use of DNA in forensic science.

Основные результаты в сравнении по АТЕ



Перечень ОО, продемонстрировавших наиболее высокие результаты ЕГЭ



Deoxyribonucleic acid (DNA) is a nucleic acid that contains the genetic instructions used in the development and functioning of all known living organisms and some viruses. The main role of DNA molecules is the long-term storage of information. DNA often serves as a template for the synthesis of messenger RNA. RNA transcripts are then used to synthesize the proteins that are often the effectors of a cell's response to external stimuli. DNA has been found to code for rRNA and tRNA molecules, but other DNA sequences have structural or regulatory functions. They are not directly translated into proteins. Chemically, DNA consists of two long polymers of simple units called nucleotides, with phosphate groups joined by ester bonds. These two strands run in opposite directions to each other and are therefore anti-parallel. Attached to each sugar is one of four types of molecules called bases. It is the sequence of these four bases along the backbone that encodes information. This information is read using the genetic code, which specifies the sequence of the amino acids within proteins. The code is read by copying stretches of DNA into the related molecule, messenger RNA, in a process called transcription.

Within cells, DNA is organized into long structures called chromosomes. These chromosomes are duplicated before cells divide, in a process called DNA replication. Eukaryotic organisms (animals, plants, fungi, and protists) store most of their DNA inside the cell nucleus and some of their DNA in organelles such as mitochondria and chloroplasts. In contrast, prokaryotes (bacteria and archaea) store their DNA only in the cytoplasm. Within the chromosomes, chromatin proteins such as histones compact and organize DNA. These complex structures provide the cell with various mechanisms of controlling gene expression. Other proteins, called non-coding RNA, are also transcribed from DNA, and other proteins, helping control which parts of the DNA are transcribed.

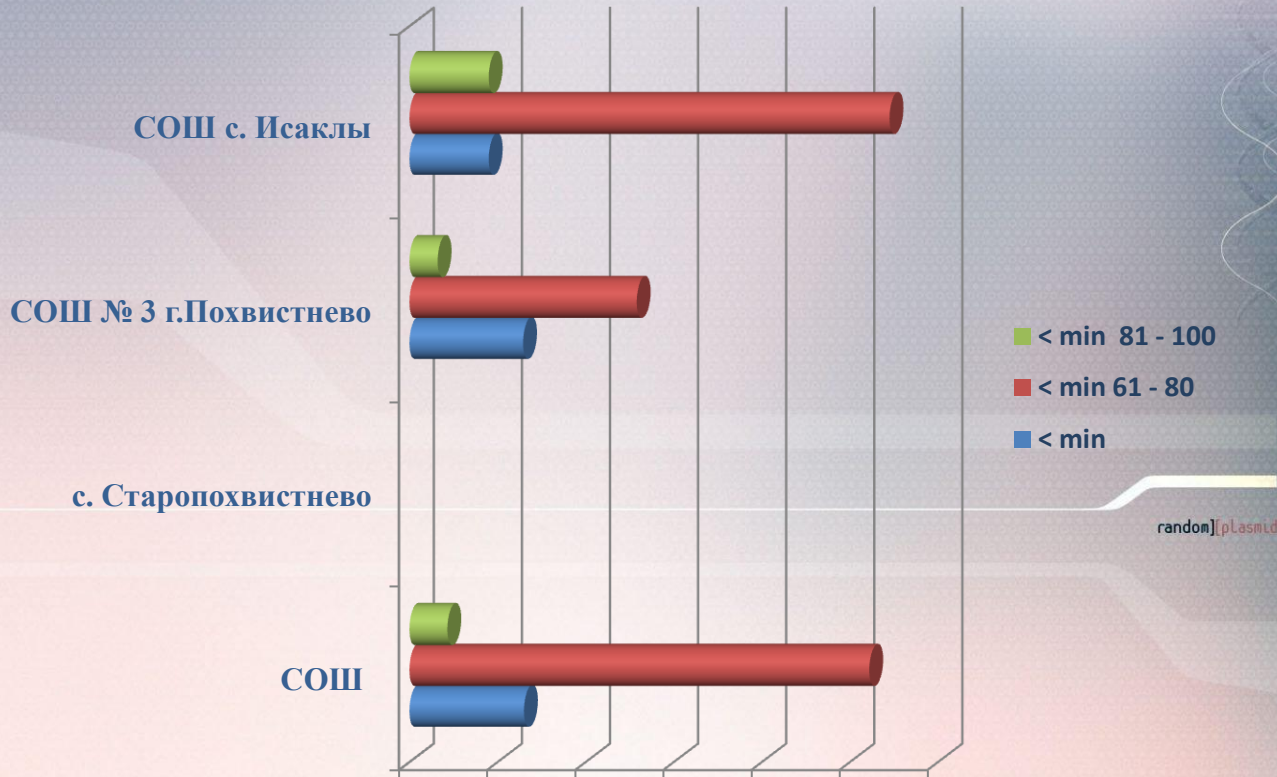
DNA is a double helix structure. The two strands are made of nucleotides. Each nucleotide is composed of a phosphate group, a sugar, and a nitrogenous base. The phosphate group is linked to the sugar, and the sugar is linked to the nitrogenous base. The nitrogenous base is linked to the other strand, forming the double helix structure.

The DNA double helix is a right-handed spiral. The two strands are twisted around each other. The distance between two consecutive turns of the helix is called the pitch. The pitch of the DNA double helix is approximately 3.4 nanometers.

The DNA double helix is held together by hydrogen bonds between the nitrogenous bases. The bases are paired in a specific way: Adenine (A) pairs with Thymine (T), and Guanine (G) pairs with Cytosine (C). This base pairing is called complementary base pairing.

The DNA double helix is a very stable structure. It is able to store genetic information for a long time. The DNA double helix is also able to replicate itself. This is done by using the original strands as templates to synthesize new strands.

Перечень ОО, продемонстрировавших наиболее низкие результаты ЕГЭ



Deoxyribonucleic acid (DNA) is a nucleic acid that contains the genetic instructions used in the development and functioning of all known living organisms and some viruses. The information DNA often compared to a set of blueprints or a recipe, or a code, since it contains the instructions needed to construct other components of cells, such as proteins and RNA molecules. The DNA segments that carry this genetic information are called genes, but other DNA sequences have structural purposes, or are involved in regulating the use of this genetic information.

Chemically, DNA consists of two long polymers of simple units called nucleotides, with phosphate groups joined by ester bonds. These two strands run in opposite directions to each other and are therefore anti-parallel. Attached to each sugar is one of four types of molecules called bases. It is the sequence of these four bases along the backbone that encodes information. This information is read using the genetic code, which specifies the sequence of the amino acids within proteins. The code is read by copying stretches of DNA into the related molecule, messenger RNA, in a process called transcription.

Within cells, DNA is organized into long structures called chromosomes. These chromosomes are duplicated before cells divide, in a process called DNA replication. Eukaryotic organisms (animals, plants, fungi, and protists) store most of their DNA inside the cell nucleus and some of their DNA in organelles, such as mitochondria and chloroplasts. In contrast, prokaryotes (bacteria and archaea) store their DNA only in the cytoplasm. Within the chromosomes, chromatin packages the DNA into structures called nucleosomes. These compact structures give the chromosomes their characteristic structure, helping control which parts of the DNA are transcribed.

DNA is a double helix structure. The two strands are made of a sugar-phosphate backbone, with nitrogenous bases attached to the sugar. The strands are held together by hydrogen bonds between the bases. The sequence of the bases on one strand determines the sequence of the bases on the other strand. This is called complementary base pairing.

The DNA double helix is a right-handed helix. The distance between two consecutive turns of the helix is called the pitch. The pitch of the DNA double helix is approximately 3.4 nanometers. The diameter of the DNA double helix is approximately 2 nanometers.

The DNA double helix is a very stable structure. It is able to store information for a long time. The DNA double helix is also able to replicate itself. This is done by using the original double helix as a template to create a new double helix.

The DNA double helix is a very important molecule. It is the source of all genetic information. It is also the source of all life. Without DNA, life would not be possible.

Выводы по итогам основных результатов ЕГЭ

Доля участников, получивших тестовый балл от минимального балла до 60 баллов, увеличилась и составила 48,4 %, в 2020 – 44,3%.

Доля участников, получивших от 61 до 80 баллов, увеличилась и составило 39,05 %, в 2020 году – 37,4 %.

Доля участников, получивших от 81 до 99 баллов, увеличилась и составила **6,5 %**, в 2020 - **6,4 %**

Доля участников, набравших балл ниже минимального, ниже значений 2020 года и составил **6,0 %**, в 2020 году – **11,8 %**,

Средний балл по математике профильного уровня ниже областного значения – **54,9**, по Самарской области – **58,4**.

Минимальный первичный балл – 0
Максимальный первичный балл – 26
Средний первичный балл – 12,01

random]plasmid



Краткая характеристика КИМ

	Часть 1	Часть 2
	8	11
Тип заданий и форма ответа	1-8 с кратким ответом в виде целого числа или конечной десятичной дроби	9-12 с кратким ответом в виде целого числа или конечной десятичной дроби 13-19 с развёрнутым ответом (полная запись решения с обоснованием выполненных действий)
Назначение	проверка освоения базовых умений и практических навыков применения математических знаний в повседневных ситуациях	проверка освоения математики на профильном уровне, необходимом для применения математики в профессиональной деятельности и на творческом уровне
Уровень сложности	Базовый	Повышенный и высокий
Проверяемый учебный материал курсов математики	<ol style="list-style-type: none"> 1. Математика 5-6-х классов 2. Алгебра 7-9-х классов 3. Алгебра и начала анализа 10-11-х классов 4. Теория вероятностей и статистика 7-9-х классов 5. Геометрия 7-11-х классов 	<ol style="list-style-type: none"> 1. Алгебра 7-9-х классов 2. Алгебра и начала анализа 10-11-х классов 3. Геометрия 7-11-х классов



Результаты выполнения заданий базового уровня сложности



Deoxyribonucleic acid (DNA) is a nucleic acid that contains the genetic instructions used in the development and functioning of all known living organisms and some viruses. The main role of DNA molecules is the long-term storage of information. DNA is often compared to a set of blueprints or a recipe, or a code, since it contains the instructions needed to construct other components of the cell, such as proteins and RNA molecules. The DNA segments that carry this genetic information are called genes, but other DNA sequences have structural purposes, or are involved in regulating the use of this genetic information.

Chemically, DNA consists of two long polymers of simple units called nucleotides, with phosphate groups joined by ester bonds. These two strands run in opposite directions to each other and are therefore anti-parallel. Attached to each sugar is one of four types of molecules called bases. It is the sequence of these four bases along the backbone that encodes information. This information is read using the genetic code, which specifies the sequence of the amino acids within proteins. The code is read by copying stretches of DNA into the related molecule, messenger RNA, in a process called transcription.

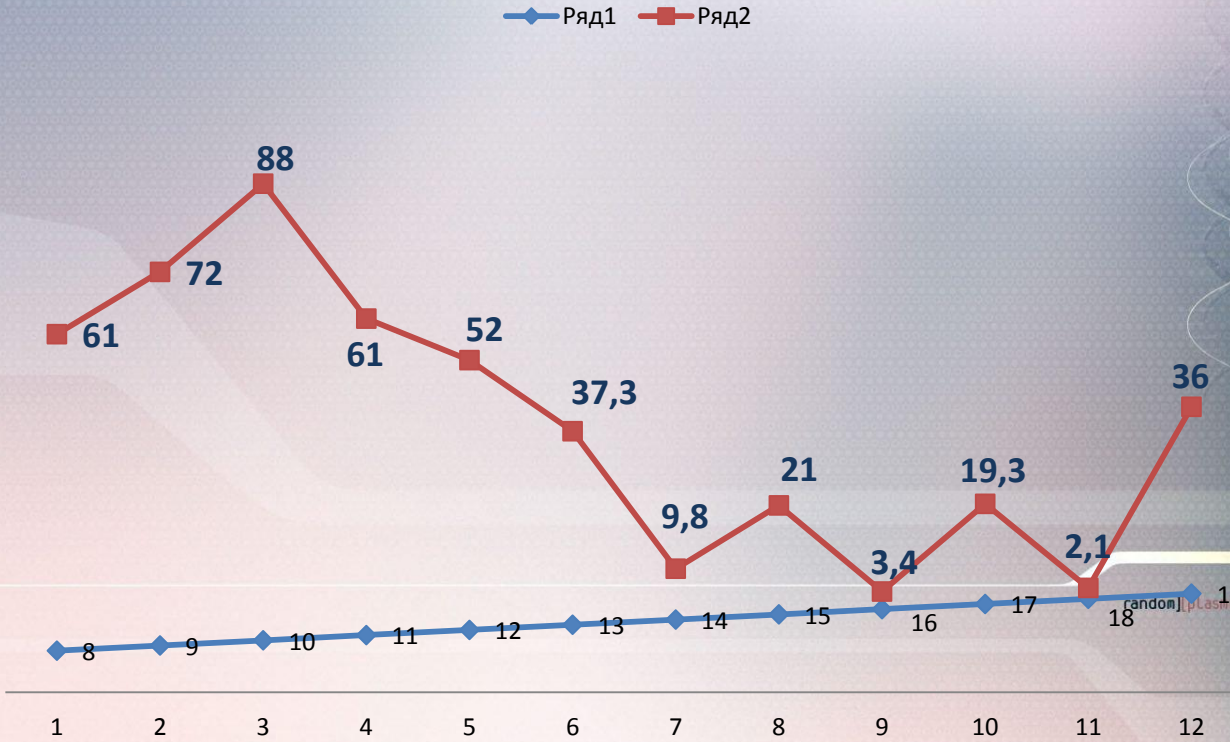
Within cells, DNA is organized into long structures called chromosomes. These chromosomes are duplicated before cells divide, in a process called DNA replication. Eukaryotic organisms (animals, plants, fungi, and protists) store most of their DNA inside the nucleus, and some of their DNA in organelles, such as mitochondria or chloroplasts. In contrast, prokaryotes (bacteria and archaea) store their DNA only in the cytoplasm. Within the chromosomes, chromatin proteins such as histones compact and organize DNA, these complex structures guide the interactions between DNA and other proteins, helping control which parts of the DNA are transcribed.

DNA is a double helix structure. The two strands are held together by hydrogen bonds between the nitrogenous bases. The bases are attached to the sugar-phosphate backbone. The sequence of bases along a strand determines the genetic code.

The DNA double helix is a right-handed spiral. The distance between two full rotations is called the pitch. The pitch of the DNA double helix is approximately 3.4 nanometers.

The DNA double helix is a right-handed spiral. The distance between two full rotations is called the pitch. The pitch of the DNA double helix is approximately 3.4 nanometers.

Результаты выполнения заданий повышенного уровня сложности



Deoxyribonucleic acid (DNA) is a nucleic acid that contains the genetic information used in the development and functioning of all known living organisms and some viruses. The information in DNA is often compared to a set of blueprints or a recipe, or a code, since it contains the instructions needed to construct other components of the cell, such as proteins and RNA molecules. The DNA segments that carry this genetic information are called genes, but other DNA sequences have structural purposes, or are involved in regulating the use of this genetic information.

Chemically, DNA consists of two long polymers of simple units called nucleotides, with the bases made of sugars and phosphate groups joined by ester bonds. These two strands run in opposite directions to each other and are therefore anti-parallel. Attached to each sugar is one of four types of molecules called bases. It is the sequence of these four bases along the base that encodes information. This information is read using the genetic code, which specifies the sequence of the amino acids within proteins. The code is read by copying stretches of DNA into the related molecule, messenger RNA, in a process called transcription.

Within cells, DNA is organized into long structures called chromosomes. These chromosomes are duplicated before cells divide, in a process called DNA replication. Eukaryotic organisms (animals, plants, fungi, and protists) store most of their DNA inside the cell nucleus and some of their DNA in organelles, such as mitochondria or chloroplasts. In contrast, prokaryotes (bacteria and archaea) store their DNA only in the cytoplasm. Within the chromosomes, chromatin proteins such as histones compact and organize DNA, resulting in higher-order structures that give the chromosomes their complex 3-D structures, helping control between DNA and other proteins. Helping control which parts of the DNA are transcribed.

DNA is a double helix structure. It is made up of two strands that are twisted around each other. The strands are held together by hydrogen bonds between the nitrogenous bases. The bases are attached to the sugar-phosphate backbone. The sugar-phosphate backbone is made up of alternating phosphate and sugar residues. The phosphate groups are attached to the 5' carbon of the sugar, and the sugar is attached to the 3' carbon of the phosphate. The nitrogenous bases are attached to the 1' carbon of the sugar. The bases are paired up with each other, forming the rungs of the ladder. The pairing is specific: Adenine pairs with Thymine, and Guanine pairs with Cytosine. The overall structure is a right-handed helix.

13 а) Решите уравнение

$$2 \sin\left(x + \frac{\pi}{3}\right) + \cos 2x = \sqrt{3} \cos x + 1.$$

б) Укажите корни этого уравнения, принадлежащие отрезку $\left[-3\pi; -\frac{3\pi}{2}\right]$.

14 Все рёбра правильной треугольной призмы $ABCA_1B_1C_1$ имеют длину 6. Точки M и N — середины рёбер AA_1 и A_1C_1 соответственно.

- а) Докажите, что прямые BM и MN перпендикулярны.
б) Найдите угол между плоскостями BMN и ABB_1 .

ИЛИ

В правильной четырёхугольной пирамиде $SABCD$ сторона AB основания равна 16, а высота пирамиды равна 4. На рёбрах AB , CD и AS отмечены точки M , N и K соответственно, причём $AM = DN = 4$ и $AK = 3$.

- а) Докажите, что плоскости MNK и SBC параллельны.
б) Найдите расстояние от точки M до плоскости SBC .

15 Решите неравенство $\log_{11}(8x^2 + 7) - \log_{11}(x^2 + x + 1) \geq \log_{11}\left(\frac{x}{x+5} + 7\right)$.



16

Две окружности касаются внешним образом в точке K . Прямая AB касается первой окружности в точке A , а второй — в точке B . Прямая BK пересекает первую окружность в точке D , прямая AK пересекает вторую окружность в точке C .

а) Докажите, что прямые AD и BC параллельны.

б) Найдите площадь треугольника AKB , если известно, что радиусы окружностей равны 4 и 1.

17

15 января планируется взять кредит в банке на шесть месяцев в размере 1 млн рублей. Условия его возврата таковы:

- 1-го числа каждого месяца долг увеличивается на r процентов по сравнению с концом предыдущего месяца, где r — целое число;
- со 2-го по 14-е число каждого месяца необходимо выплатить часть долга;
- 15-го числа каждого месяца долг должен составлять некоторую сумму в соответствии со следующей таблицей.

Дата	15.01	15.02	15.03	15.04	15.05	15.06	15.07
Долг (в млн рублей)	1,0	0,6	0,4	0,3	0,2	0,1	0

Найдите наибольшее значение r , при котором общая сумма выплат будет меньше 1,2 млн рублей.

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Within cells, DNA is organized into long structures called chromosomes. These chromosomes are duplicated before cells divide, in a process called DNA replication. Eukaryotic organisms generally have two sets of chromosomes, one set in each nucleus and one set in each mitochondrion. Bacteria and archaea store their DNA only as a single chromosome. Within the chromosomes, chromatin fibers are composed of nucleosomes, which are segments of DNA that are tightly packed together. These compact structures give the chromosomes their characteristic X-shape. The DNA sequences that encode proteins and other genes, helping control which parts of the DNA are transcribed.

DNA is a double-stranded molecule. Each strand is made of a sugar-phosphate backbone with nitrogenous bases attached to the sugar. The two strands are held together by hydrogen bonds between the bases. The bases are called nucleobases and are of four types: adenine, thymine, guanine, and cytosine. Adenine and thymine are paired together, as are guanine and cytosine. This pairing is called base pairing. The sequence of bases along a strand of DNA is called the genetic code. This code is used to synthesize proteins. The process of synthesizing proteins from a DNA template is called protein synthesis. It involves two main steps: transcription and translation. Transcription is the process of copying a segment of DNA into a complementary RNA strand. Translation is the process of using the RNA template to synthesize a protein. The genetic code is universal, meaning that it is the same in all organisms. This suggests that all life on Earth shares a common ancestor.

Chromosome number 1 is the largest human chromosome, containing approximately 240 million base pairs. It is located in the first pair of chromosomes in a karyotype. Chromosome 1 is a metacentric chromosome, meaning that the centromere is located in the middle of the chromosome. It is involved in many cellular processes, including cell division and gene expression. Mutations in chromosome 1 can lead to various genetic disorders, such as Down syndrome and Prader-Willi syndrome.

DNA does not usually exist as a single molecule, but instead as a pair of molecules called a double helix. The two strands are held together by hydrogen bonds between the nitrogenous bases. The bases are called nucleobases and are of four types: adenine, thymine, guanine, and cytosine. Adenine and thymine are paired together, as are guanine and cytosine. This pairing is called base pairing. The sequence of bases along a strand of DNA is called the genetic code. This code is used to synthesize proteins. The process of synthesizing proteins from a DNA template is called protein synthesis. It involves two main steps: transcription and translation. Transcription is the process of copying a segment of DNA into a complementary RNA strand. Translation is the process of using the RNA template to synthesize a protein. The genetic code is universal, meaning that it is the same in all organisms. This suggests that all life on Earth shares a common ancestor.

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Найдите все положительные значения a , при каждом из которых система

$$\begin{cases} (|x| - 5)^2 + (y - 4)^2 = 9, \\ (x + 2)^2 + y^2 = a^2 \end{cases}$$

имеет единственное решение.

В школах № 1 и № 2 учащиеся писали тест. Из каждой школы тест писали, по крайней мере, 2 учащихся, а суммарно тест писали 9 учащихся. Каждый учащийся, писавший тест, набрал натуральное количество баллов. Оказалось, что в каждой школе средний балл за тест был целым числом. После этого один из учащихся, писавших тест, перешёл из школы № 1 в школу № 2, а средние баллы за тест были пересчитаны в обеих школах.

- Мог ли средний балл в школе № 1 уменьшиться в 10 раз?
- Средний балл в школе № 1 уменьшился на 10%, средний балл в школе № 2 также уменьшился на 10%. Мог ли первоначальный средний балл в школе № 2 равняться 7?
- Средний балл в школе № 1 уменьшился на 10%, средний балл в школе № 2 также уменьшился на 10%. Найдите наименьшее значение первоначального среднего балла в школе № 2.

ИЛИ

На доске написаны десять различных натуральных чисел, которые удовлетворяют двум условиям: среднее арифметическое шести наименьших из них равно 5, а среднее арифметическое шести наибольших равно 15.

- Может ли наименьшее из этих десяти чисел равняться 3?
- Может ли среднее арифметическое всех этих десяти чисел равняться 11?
- Каково наибольшее возможное значение среднего арифметического всех этих десяти чисел при данных условиях?



ВЫВОДЫ об итогах анализа выполнения заданий, групп заданий

Перечень умений и видов деятельности, усвоение которых в целом можно считать достаточным:

- решать практико-ориентированные задания,
- простейшие планиметрические задачи на клетчатой бумаге
- простейшие задачи по теории вероятностей
- простейшие показательные и тригонометрические уравнения

random]pLasmd



Перечень умений и видов деятельности, усвоение которых в целом нельзя считать достаточным

- не владеют методами отбора корней и уравнений (с помощью числовой окружности, графически, оценкой параметра n);
- допускают ошибки при применении метода решения тригонометрического уравнения вынесением общего множителя за скобки;
- не умеют выполнять геометрические построения на плоскости и в пространстве, не умеют доказывать геометрические утверждения;
- допускают ошибки при решении показательных неравенств, дробно-рациональных неравенств;
- забывают находить и ошибаются в нахождении ОДЗ при решении неравенств;
- затрудняются математически грамотно записать найденный ответ в задании и обосновать его (задания 18, 19).



Рекомендации по совершенствованию преподавания учебного предмета

- основное внимание сосредоточить на подготовке к выполнению части 1
- работа по повышению уровня вычислительных навыков учащихся
- формирование и развитие умений выполнять действия с геометрическими фигурами, функциями, строить и исследовать простейшие математические модели
- организовать обсуждение на ШМО

