

Date: 21-10-25

Day: Tuesday

Name Ume-Farwa
Batch 83 (41203)
Mock Exam III
(10:30 to 1:30)

General Science and
Ability (GSA)

PART - II

Section - I

Q. NO. 2

(a) "Data is new oil."

Do you agree?
Justify with examples.

Answer:

Yes, I agree
with this statement.

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Just ^{as} oil fueled the industrial revolution, data fuels the digital revolution of today. It is a valuable resource that drives business decisions, innovation, and technology. Companies collect, analyze and use data to improve services and predict human behavior.

Examples:

1. E-Commerce: Amazon uses user data to recommend suitable products.

2. Social Media:

Facebook and Instagram use data for personalized advertisements.

3. Navigation: Google Maps uses location data

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to show real-time traffic updates.

So proves that, data has become the economic and technological fuel of the modern world

(b)

Universe is expanding how it resembles a balloon blowing in working

Answer:

The expansion of the Universe can be compared to a balloon being inflated. When we draw dots on the balloon's surface and blow air into it, the balloon expands and the dots move away from

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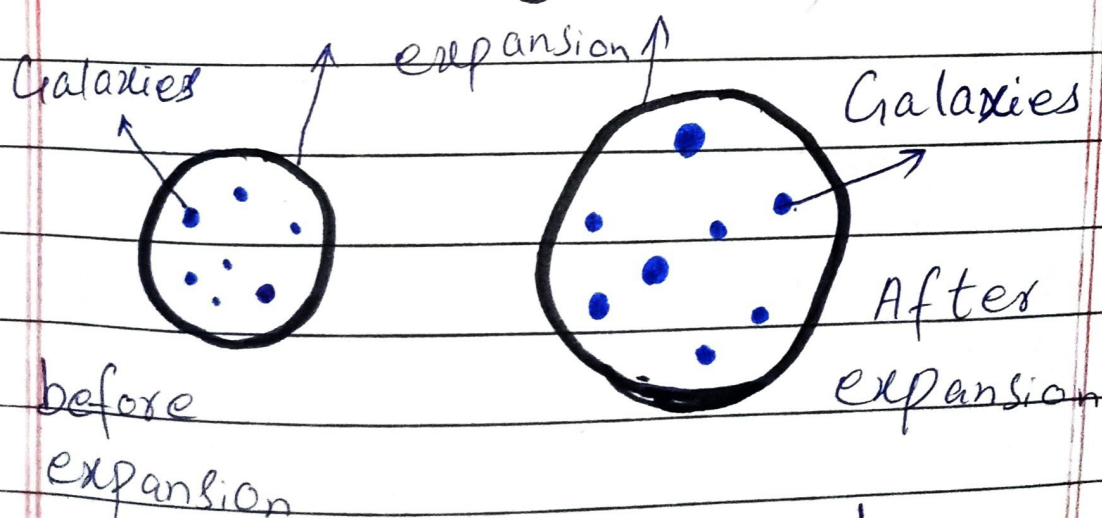
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each other.

Similarly, in the expanding Universe, galaxies move away from one another as space itself stretches.

The galaxies are not traveling through space but are being carried apart by the **expansion of space**. This analogy helps explain **Hubble's discovery** that the Universe is continuously expanding in all directions.

Diagram



⇒ "As a balloon expands, galaxies move apart - similar to

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the expanding Universe?

(C)

What is balanced diet? Deficiency of Vitamins A, D and E causes what imbalance

Answer:

A balanced diet is one that contains the right proportions of Carbohydrates, proteins, fats, Vitamins, minerals, fiber and water necessary for growth energy and good health.

Vitamin deficiencies:

Vitamin A: Causes night blindness and dry eyes.

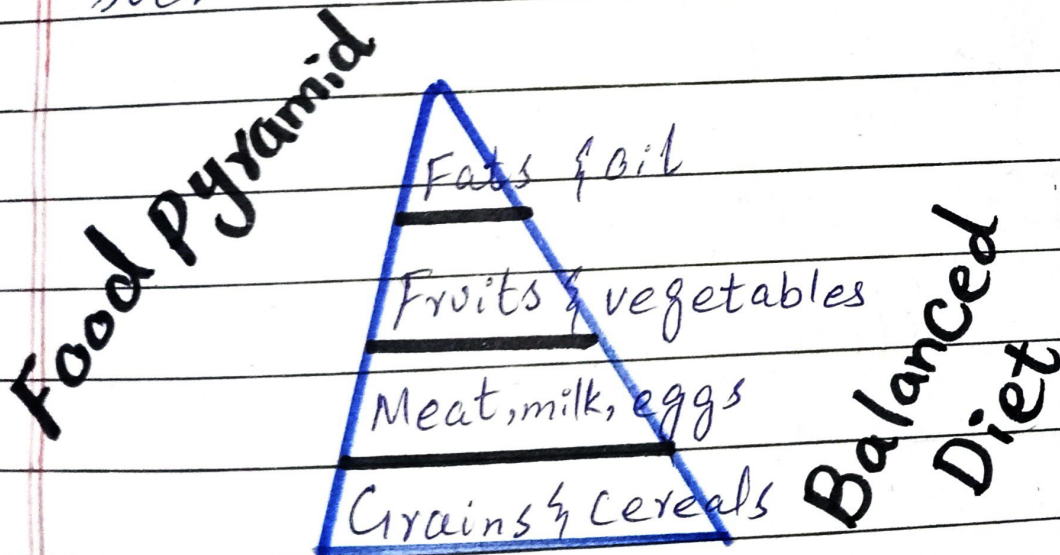
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Vitamin D: Leads to rickets in children and weak bones in adults.

Vitamin E: Causes muscle weakness and nerve problems.

Hence, a balanced diet ensures proper functioning of the body and prevents such nutritional imbalances.



(d) Discuss working of Gps.

What is fiber optic?

How are 2D & 3D locations

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measured by satellites?

Working of GPS: The Global positioning system consists of satellites orbiting Earth. These satellites send signals to GPS receivers on the ground which calculate their position by measuring the travel time of signals from at **least** four satellites.

Fiber Optic: It is a thin glass or plastic cable that carries data as light signals, allowing high-speed communication and internet connectivity.

2D { 3D Location measurement

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★ 2D location (Latitude, longitude):

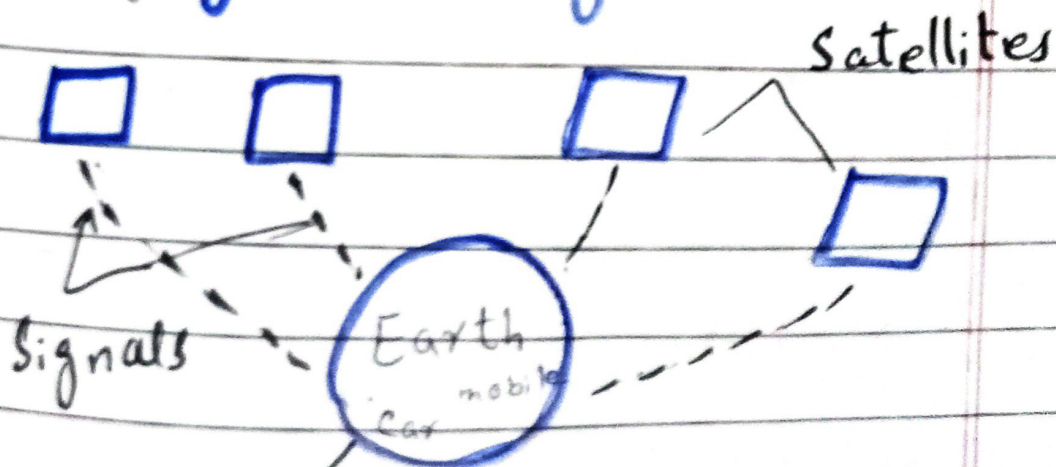
needs signals from three satellites

★ 3D location (latitude, longitude, altitude):

needs signals from four or more satellites for accuracy.

Thus, GPS and fiber optics are vital technologies for modern communication and

navigation systems.



⇒ "Working of GPS through satellites"

Question: 3

(a) Why do cells from organelles? Discuss mitochondria in a human cell.

Answer: Cells from organelles to perform specific functions efficiently within limited space. Organelles divide the cell's interior into compartments, allowing different biochemical processes to occur simultaneously without interference.

Mitochondria:

→ Known as

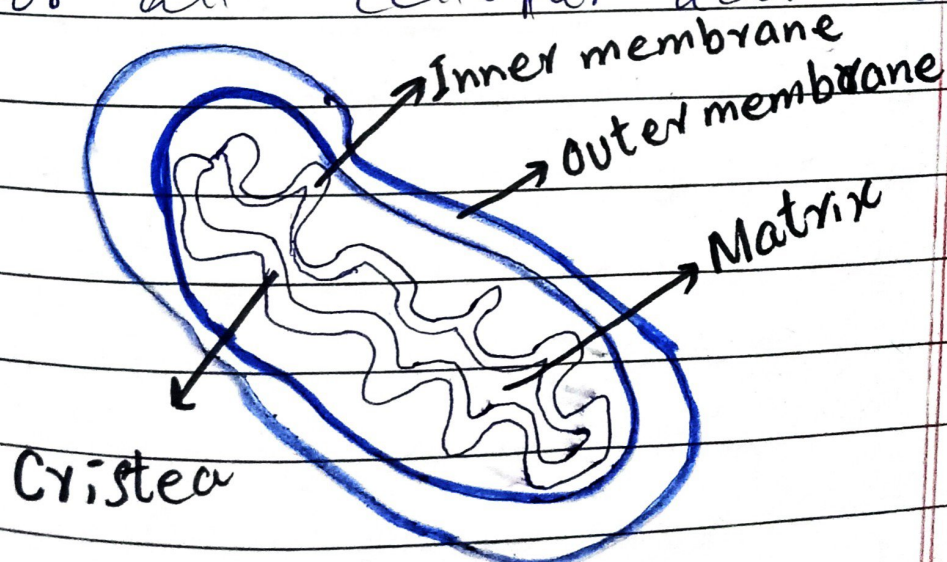
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the "powerhouse of the cell."

- They produce energy (ATP) through a process called cellular respiration.
- Have double membranes and contain their own DNA, allowing limited self-replication.
- Abundant in energy demanding cells such as muscle and nerve cells.

Thus, mitochondria provide the energy required for all cellular activities.



Mitochondria

(b)

What is doping?
Discuss different types of semiconductors.

Answer:

Doping is the process of adding small amounts of impurities to a pure semiconductor (like silicon) to change its electrical conductivity.

Types of Semiconductors

1 N-type Semiconductors

- Doped with pentavalent (5-valence) atoms like Phosphorus or Arsenic.
- Adds extra electrons
→ negative charge carriers.

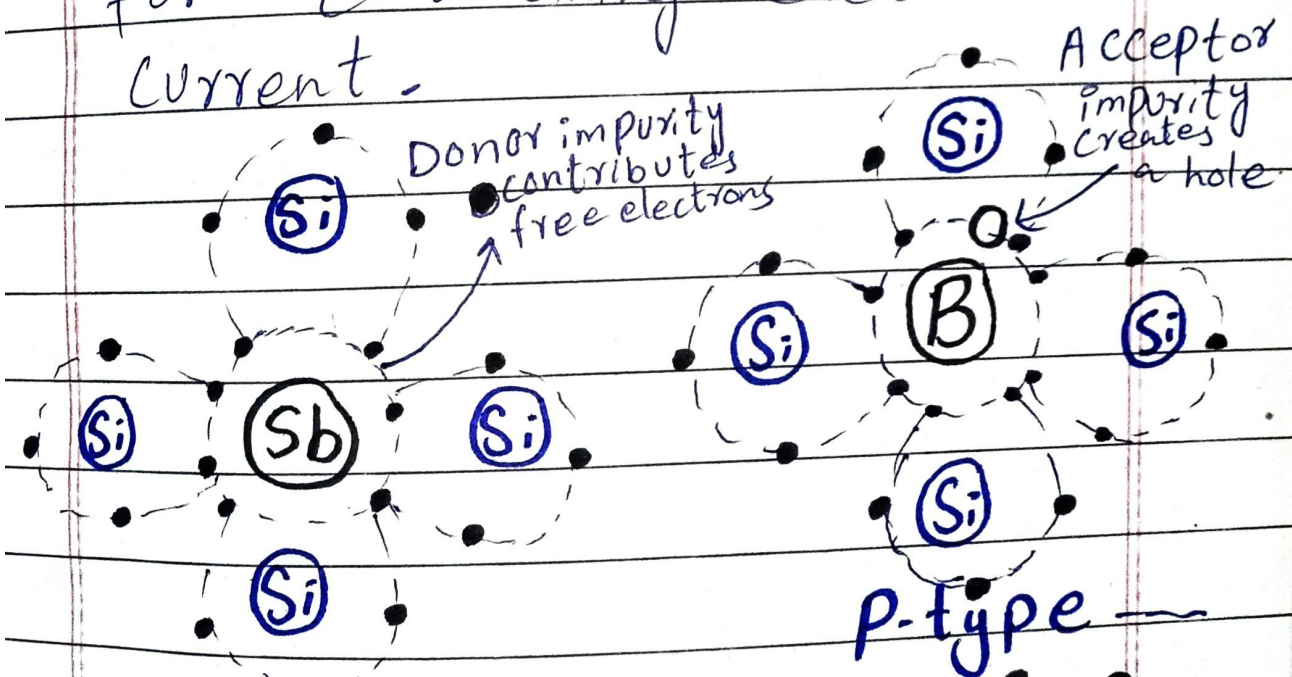
2 P-type Semiconductor:

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- Doped with trivalent (3-valence) atoms like boron or gallium.
- Creates holes (positive charge carriers).

Both types are used in electronic devices such as diodes and transistors for controlling electric current.



n-type Semiconductor

Sb: Antimony

Si: Silicon

B = Boron

Si = Silicon

(C) Merits and demerits of volcanic eruption.

Merits:

- 1 Volcanic ash increases soil fertility.
- 2 Formation of new landforms and islands
- 3 Geothermal energy can be produced from volcanic region

Demerits:

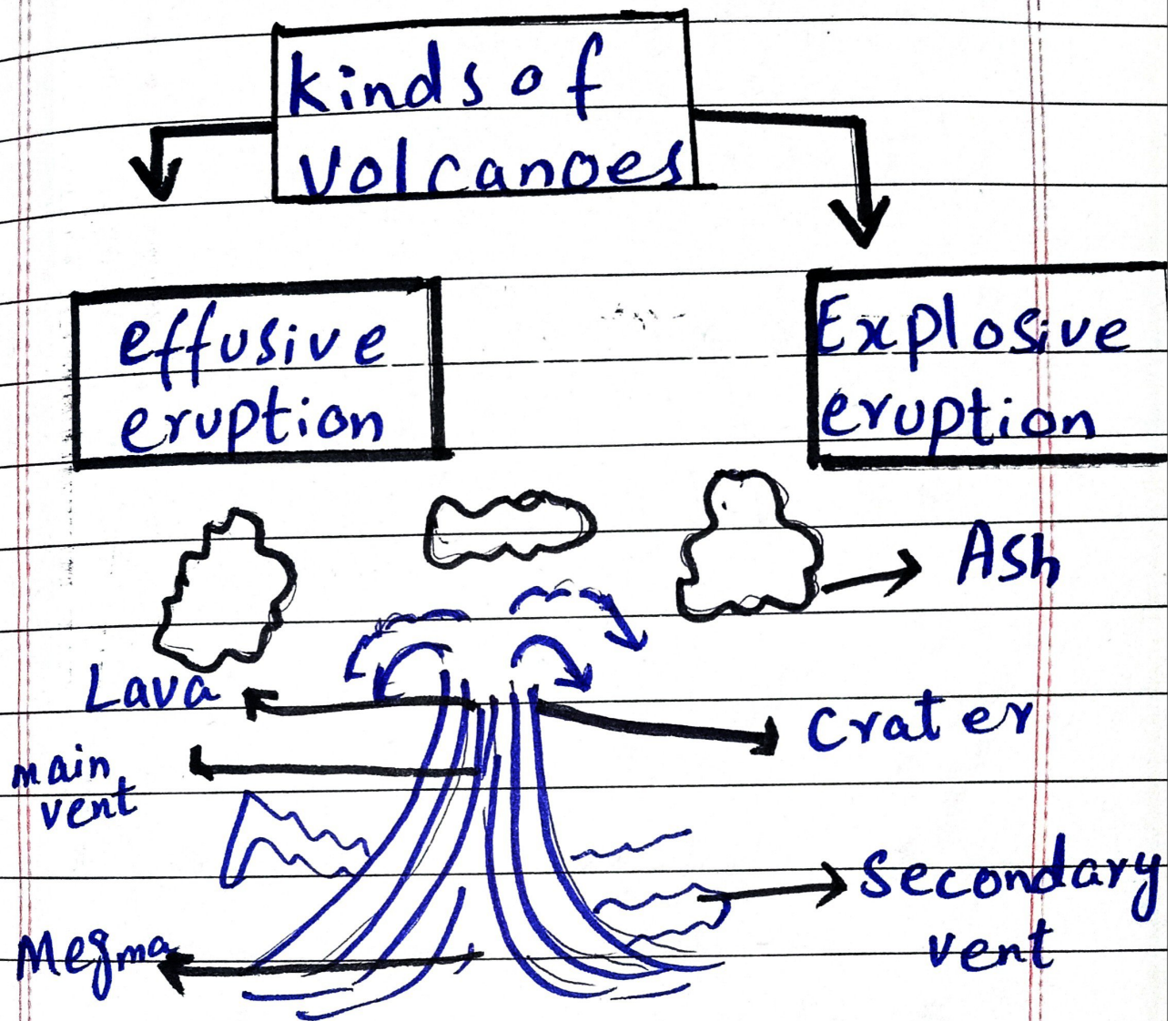
- 1 Causes loss of lives and property due to lava and gas
- 2 Leads to air pollution and breathing problems.
- 3 Can cause climate change by releasing dust and sulfur compounds into the atmosphere.

Hence, volcanic eruptions

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have both beneficial and destructive effects on earth.



Volcanic

(d)

What is dengue? Discuss symptoms causative agents and remedies?

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Dengue is a viral disease transmitted by the bite of Aedes mosquitoes.

Causative Agent

Dengue virus (a Flavivirus with four types - DEN-1 to DEN-4).

Symptoms

- * High fever
- * Severe headache and pain behind eyes.
- * Muscle and joint pain.
- * Nausea, vomiting and skin rash.

Remedies

No Specific cure: rest fluids, and pain relievers are used.

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- Avoid mosquito bites.
Use repellents, nets and remove stagnant water.
- Vaccines are available in some countries to prevent infection.

Thus, dengue can be controlled through public awareness and mosquito control measures.

SECTION-II

Q NO. 6

(a) Ratio of candies
Given

Apple; Berry; Cherry; Date
3 : 6 : 2 : 5

Apple exceed Date by 35

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Suppose each part = x

$$5x - 3x = 35$$

$$2x = 35$$

$$x = \frac{35}{2} = 17.5$$

Apple $3 \times 17.5 = 52.5$

Berry $6 \times 17.5 = 105$

Cherry $2 \times 17.5 = 35$

Date $5 \times 17.5 = 87.5$

Berry candies = 105

(b)

Discount and

Tax on camera

Marked price = \$200

Discount = 25% of 200 = \$50

Price after discount = $200 - 50 = 150$

Tax = 6% of 150 = 9 = ~~150~~

Total cost = $150 + 9 = \$159$

Answer = \$159

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(C)

Bicycle Time Calculation

Distance = 36 km

Speed = 18 km/h

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}} = \frac{36}{18} = 2 \text{ hours}$$

Starting time = 1:00 PM

Arrival time = 3:00 PM

Reached at 3:00 PM

(d) Unscramble the Math Terms

STSTAICTS → STATISTICS

LGEBMAR → ALGEBRA



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Q NO. 7

(a) Volume of Sphere

Given:

Diameter = 14 cm

Radius = 7 cm

$$\pi = \frac{22}{7}$$

Formula

$$V = \frac{4}{3} \pi r^3$$

Solution

$$V = \frac{4}{3} \times \frac{22}{7} \times 7^3$$

$$V = \frac{4}{3} \times 1078$$

$$\text{Volume} = 1437.3 \text{ cm}^3$$

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(b)

Ratio of Savings

Total Savings = 25000 Rs

Ratio = 1 : 2 : 3 : 4 : 5

Sum of ratios = $1 + 2 + 3 + 4 + 5 = 15$

value of one part = $25000 \div 15$
 $= 1666.67$

Smallest share = Rs. 1666.67

(c) Series

i) 2, 6, 18, 162, 486

$\times$ by 3

$$2 \times 3 = 6$$

$$6 \times 3 = 18$$

$$18 \times 3 = 162$$

$$162 \times 3 = 486$$

No error in
sequence

No number is incorrect

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(ii) 3, 5, 7, 11, 13, 17Prime number
series.Next number after
13 = 17Answer = 17

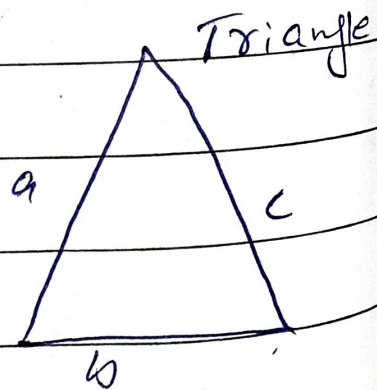
(d) Triangle Angles

Given sides

$$a = 5 \text{ cm}$$

$$b = 12 \text{ cm}$$

$$c = 13 \text{ cm}$$



Check

$$5^2 + 12^2 = 13^2$$

$$25 + 144 = 169$$

Opposite 13 cm $\rightarrow$

$$\text{Angle } C = 90^\circ$$

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Use trigonometry

$$\sin A = \frac{5}{13} \Rightarrow A = \sin^{-1}$$

$$\frac{5}{13} \approx 22.62^\circ$$

$$B = 90^\circ - 22.62^\circ \approx 67.38^\circ$$

Angles:

$$A = 22.6^\circ$$

$$B = 67.4^\circ$$

$$C = 90^\circ$$

