

1. The expression $\frac{\sqrt[3]{4} (a^{-2})^{-2}}{(\sqrt[3]{2})^{-1} (-a^{-2})^3}$ is equal to

- $-2 \cdot a^{-2}$
- $\sqrt[3]{2} \cdot a^9$
- $-2 \cdot a^{10}$
- $2 \cdot a^{-10}$

2. Which of the curves given below contain the point (2,3)? Indicate all correct answers.

- $y = 4x^2 - 7x + 1$
- $y = 3x - 3$
- $y = 3x + 2$
- $3y = 2x$

3. How many positive integers are divisors of the number 100?

Answer:

4. Which expressions are equivalent to $\frac{x^2 + x - 2}{x^2 + 4x + 4}$?

$1 - \frac{3}{x + 2}$

1

$\frac{x - 1}{x + 2}$

$\frac{x - 2}{4x + 4}$

5. The price of a book increases by 20 %. After a while the price decreases by 20 %. What is the price after the two changes?

- 4 % more as at the beginning.
- 96 % of the initial price.
- It is impossible to determine.
- The same as at the beginning.

6. On an island, each inhabitant is either a Knight, who always tells the truth, or a Knave, who always lies. You meet three inhabitants: Alan, Bella, and Carl. They make the following statements:

1. Alan says: "Bella is a Knave."
2. Bella says: "Carl and I are of opposite types."
3. Carl says: "Alan is a Knight."

Based on these statements, determine who is who:

- Alan is a Knight, Bella is a Knight, Carl is a Knave.
- Alan is a Knight, Bella is a Knave, Carl is a Knave.
- Alan is a Knave, Bella is a Knave, Carl is a Knight.
- Alan is a Knave, Bella is a Knight, Carl is a Knave.

7. State the hexadecimal equivalent of the binary number 11111011.
- 42
 - 420
 - BF
 - FB
8. A thermal flask carries the following inscription: "**Keeps drinks COLD for 24 hours and HOT for 12 hours.**" Which of the following statements correctly explains this difference?
- Water has a unique property that makes it more difficult to cool than to heat.**
 - The flask is designed to allow thermal energy to flow more easily outwards than inwards.**
 - The temperature difference between a cold drink and the surrounding environment is typically smaller than that between a hot drink and the environment.**
 - This is a clear case of consumer deception.**
9. In a dark room, two identical lamps, Lamp A and Lamp B, are placed 5 meters apart. Each lamp shines equally brightly in all directions. Standing somewhere on the straight line connecting both lamps, you measure that the intensity of Lamp A is 16 times higher than the intensity Lamp B. Given that intensity decreases proportionally to the inverse square of the distance from the lamp, how far are you standing from Lamp B?

Answer:

- 10.** Zoja rides the front wheel of her bicycle across a puddle. The wet part of the bike leaves a trail on the asphalt, as presented in the sketch.
Her younger brother Nik, who has a bike with wheels half the size of Zoja's, wants to imitate her.

What kind of trail would Nik's bike leave behind the puddle?

Zoja's trail:

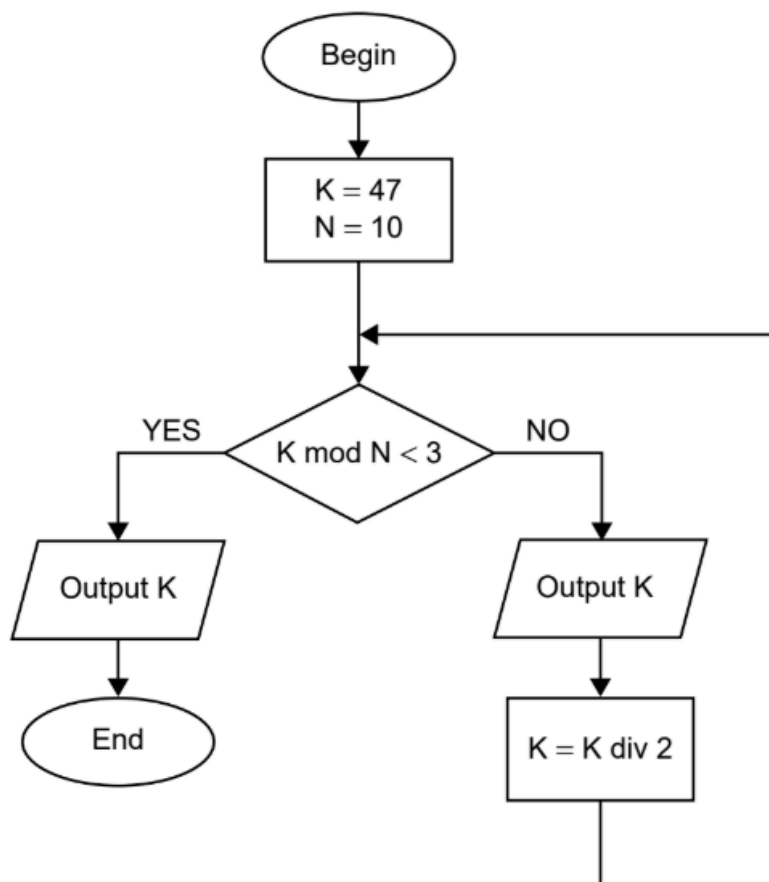


Options of Nik's trails:



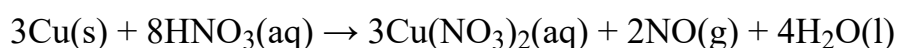
- E
- D
- C
- B
- A

11. Consider the following algorithm and determine its last output.
A mod B gives you the **remainder** when A is divided by B.
C div 2 gives you the **quotient** when C is divided by 2 without the remainder.



Answer:

12. 6.00 mol of copper, Cu, are mixed with 12.00 mol of dilute nitric acid, HNO₃(aq). The equation for the reaction that occurs is shown below.



What is the amount, in mol, of nitrogen(II) oxide, NO, produced assuming that the reaction goes to completion?

- 3,00
 18,00
 8,00
 4,00

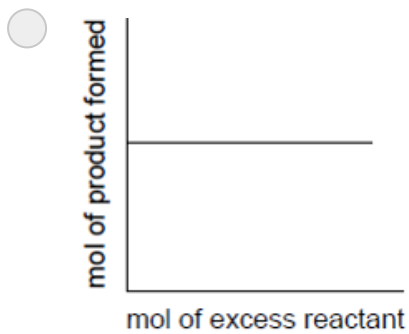
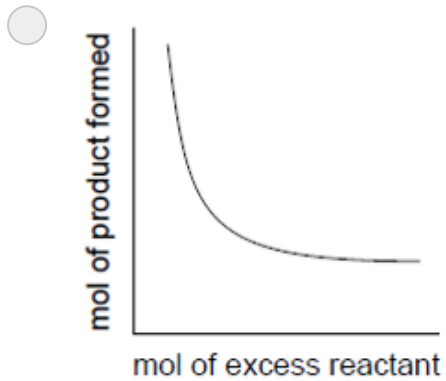
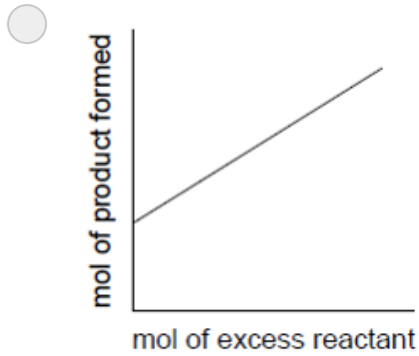
13. Crude oil is a mixture of many different chemical compounds. The table below shows information about four compounds that can be obtained from crude oil.

Compound	Chemical Formula	Melting Point (°C)	Boiling Point (°C)
Decane	$C_{10}H_{22}$	-30	+174
Ethene	C_2H_4	-169	-104
Icosane	$C_{20}H_{42}$	+37	+343
Methane	CH_4	-183	-164

Which compound in the table is a liquid at room temperature (20 °C)?

Answer:

14. Which graph shows the relationship between quantity of product formed and quantity of excess reactant **after** the limiting reactant is consumed?



15. How does insulin work?
- It causes type I diabetes.
 - It decreases blood glucose levels.
 - It increases blood glucose levels.
 - It causes type II diabetes.
16. Increased ventilation rate is a result of
- decreased physical activity and decreased O₂ level in blood.
 - decreased physical activity and increased O₂ level in blood.
 - increased physical activity and decreased CO₂ level in blood.
 - increased physical activity and increased CO₂ level in blood.
17. When interpreting the results of a study, why is it important to consider the operational definitions used by researchers?
- Operational definitions clarify how key variables are measured, ensuring accurate interpretation.
 - Operational definitions only apply to experiments, not to observational studies or surveys.
 - The study's conclusions remain valid regardless of how variables are defined.
 - Operational definitions are unnecessary because all psychological concepts have universal meanings.
18. Which of the following is the best way to determine if a study's findings are valid and reliable?
- Accept the conclusions if they align with your personal beliefs.
 - Focus only on the study's sample size without considering other factors.
 - Check whether the study has been peer-reviewed and replicable.
 - Assume the results are universally applicable regardless of context.

19. a) Read the following literary passage from *Devil's Brood* by Sharon Kay Penman and answer the questions.

Delirium was not unlike drowning, for he was caught up in a whirlpool carrying him farther and farther from reality. And when he finally regained consciousness, he had to fight his way back to the surface, gasping for breath as he broke free of the feverish currents dragging him down. The light was unbearably bright, even after he filtered it through his lashes. Gradually the room came into focus. Two of his friends, Robert and Peter, were slumped on a bench by the bed, and his servant Thomas was seated cross-legged on the floor; he wondered why they all looked so miserable. When he opened his mouth to ask them, though, the words that emerged from his throat were so slurred that even he could not understand them.

Henry compares his current situation to

- swimming in a pool of water.
 - riding favourable currents.
 - drowning in unbearably bright light.
 - struggling in turbulent waters.
- b) When opening his eyes, Henry was unable to
- emit a single sound, let alone say a word.
 - hold back his tears.
 - comprehend Robert's question.
 - understand the gloomy atmosphere in the room.

20. a) Read the passage below and answer the multiple-choice questions that follow.

Excerpt from an article:

"The rapid expansion of artificial intelligence in creative industries has sparked a debate about originality and authorship. Some argue that AI-generated works lack true creativity, as they are built on existing human input and patterns. Others claim that AI represents a new form of creativity, capable of producing innovative and unexpected results. As technology continues to evolve, the definition of authorship may need to be reconsidered."

What is the primary focus of the passage?

- The legal implications of AI in the creative industry.**
 - The debate over whether AI-generated works can be considered creative.**
 - The dangers of artificial intelligence replacing human jobs.**
 - The technical process of how AI generates artistic works.**
- b) Which of the following statements best summarizes the two perspectives mentioned in the passage?
- AI-generated works are completely original and superior to human creations.**
 - AI-generated works are based on existing data and cannot be truly creative, while others believe AI introduces a new kind of creativity.**
 - AI is only useful for assisting human creativity and has no impact on authorship.**
 - AI-generated works are identical to human-created works and should be treated the same way.**

21. Complete the sentence by choosing the correct structure.

Once I ____ my homework tomorrow, I'll go out.

- will have finished.**
- will finish**
- am going to finish**
- have finished**

22. Complete the sentence by choosing the correct structure.
By the time Jasmine was born, her mother _____ a mother to her siblings for more than 3 years.
- is
- was
- has been
- had been
23. Complete the sentence by choosing the correct structure.
She would have been able to answer the question if she _____ English, but she doesn't know a word.
- has spoken
- had spoken
- spoke
- speaks
24. Complete the sentence by choosing the correct structure.
_____ my father, I would have drowned.
- But for
- For
- Since
- Already
25. Who is known as the '**King of Rock**'?
- Answer:**
26. Which musical gave us the unforgettable hit '**You're The One That I Want**'?
- Answer:**

27. Which country was NOT part of the Central Powers in World War I?
- Germany
 - Italy
 - Ottoman Empire
 - Austria-Hungary
28. What was Benito Mussolini's nickname after he came to power in Italy?
- Il Presidente
 - Il Capo
 - Il Duce
 - Il Maestro
29. Which of the following leaders famously led the "Long March" in China?
- Mao Zedong
 - Chiang Kai-shek
 - Zhou Enlai
 - Sun Yat-sen
30. Which famous city was bombed during the Spanish Civil War, inspiring a painting by Picasso?
- Seville
 - Madrid
 - Valencia
 - Guernica
31. What is the primary role of the legislative branch of government?
- To interpret laws
 - To make laws
 - To enforce laws
 - To veto laws

32. In parliamentary systems, what typically happens if the parliament passes a vote of no confidence against the government?

- The government resigns or calls new elections**
- New parliamentary elections must be held immediately**
- The government continues unchanged**
- The judiciary takes control temporarily**

33. Which of these novels is considered a foundational work of magical realism?

- Pride and Prejudice* by Jane Austen
- Crime and Punishment* by Fyodor Dostoevsky
- The Stranger* by Albert Camus
- One Hundred Years of Solitude* by Gabriel García Márquez

34. Match each literary character on the left with the correct literary work on the right:

Holden Caulfield	The Catcher in the Rye
Rodion Raskolnikov	Great Expectations
Elizabeth Bennet	Crime and Punishment
Miss Havisham	Pride and Prejudice

