

MARINHA DO BRASIL

SERVIÇO DE SELEÇÃO DO PESSOAL DA MARINHA



**Concurso Público de Admissão à Escola Naval
CPAEN/2024**

**NÃO ESTÁ AUTORIZADA A UTILIZAÇÃO DE
MATERIAL EXTRA**

1º Dia – Prova de Matemática e Inglês

Questão 1

Assinale a opção que apresenta o valor correto de $\lim_{\theta \rightarrow 0^+} (\cotg \theta)^{2\operatorname{sen} \theta}$

- (A) 0
- (B) 1
- (C) 2
- (D) e
- (E) e^2

Questão 2

Considere um semicírculo de diâmetro $\overline{ML}$ e sua reta tangente em L. Suponha que F é um ponto desta reta tal que $\overline{FL} = \frac{\overline{FM}}{2}$. Calcule a área da porção do triângulo FML situado no exterior do semicírculo e assinale a opção correta.

- (A) $\left(\frac{5\sqrt{3}-2}{12}\right) \cdot r^2$
- (B) $\left(\frac{5\sqrt{3}-\pi}{12}\right) \cdot r^2$
- (C) $\left(\frac{\sqrt{3}-2\pi}{12}\right) \cdot r^2$
- (D) $\left(\frac{5\sqrt{2}-2\pi}{12}\right) \cdot r^2$
- (E) $\left(\frac{5\sqrt{3}-2\pi}{12}\right) \cdot r^2$

Questão 3

Seja D o conjunto formado por todas as soluções do sistema $\begin{cases} x - 2y + 3z = 4 \\ 2x + y + z = 3 \\ -x + 5y - 6z = -7 \end{cases}$. Assinale a opção que apresenta a condição que deve ser satisfeita para que a expressão $ax + by + cz$ tenha o mesmo valor para todo $(x, y, z) \in D$.

- (A) $a + b + c = 0$
- (B) $-a + b + c = 0$
- (C) $a - b + c = 0$
- (D) $a + b - c = 0$
- (E) $2a - b + c = 0$

Questão 4

Considere dois lugares geométricos definidos por:

$$\delta = \{(x, y) \in \mathbb{R}; x^2 - 8x + y^2 = 0\}; \text{ e}$$

$$\mu = \{(x, y) \in \mathbb{R}; 8x^2 + 9y^2 - 32x = 256\}.$$

Determine a razão entre a área interior a u e exterior a $\&$ e a área de μ e assinale a opção correta.

- (A) $\frac{3-\sqrt{2}}{3}$
 (B) $\frac{2-\sqrt{2}}{3}$
 (C) $\frac{3-2\sqrt{2}}{3}$
 (D) $\frac{3-5\sqrt{2}}{3}$
 (E) $\frac{3-4\sqrt{2}}{3}$

Questão 5

Denota-se a derivada de ordem n da função $y = y(x)$ por $\frac{d^n y}{dx^n}(x)$. Considere as funções $f(x) = \sin 3x$ e $g(x) = \cos 3x$. Assinale a expressão que apresenta corretamente

$$\frac{d^2(f+g)}{dx^2}(x) + \frac{d^4(f+g)}{dx^4}(x) + \frac{d^6(f+g)}{dx^6}(x) + \frac{d^8(f+g)}{dx^8}(x) + \dots + \frac{d^{2024}(f+g)}{dx^{2024}}(x).$$

- (A) $\sum_{k=0}^{2024} (-1)^{k+2} \cdot 3^{2k} (\cos 3x + \sin 3x)$
 (B) $\sum_{k=1}^{2024} (-1)^{k+2} \cdot 3^{2k} (\cos 3x + \sin 3x)$
 (C) $\sum_{k=0}^{1012} (-1)^{k+2} \cdot 3^{2k} (\cos 3x + \sin 3x)$
 (D) $\sum_{k=1}^{1012} (-1)^{k+2} \cdot 3^{2k} (\cos 3x + \sin 3x)$
 (E) $\sum_{k=1}^{2024} (-1)^{k+2} \cdot 3^{2k} (\cos 3x - \sin 3x)$

Questão 6

Uma esfera de raio 54 cm é seccionada por planos perpendiculares a um diâmetro, dividindo-o em partes proporcionais a 2, 3 e 4 e determinando os sólidos S_2 , S_3 e S_4 , respectivamente. Suponha que S_3 contenha o centro da esfera e que C_k é a razão entre o volume e a área total de S_k , para $k = 2, 3$ e 4. Calcule o valor de $C = C_2 + C_3 + C_4$ e assinale a opção correta.

- (A) $10 < C < 15$
 (B) $15 < C < 20$
 (C) $20 < C < 25$
 (D) $25 < C < 30$
 (E) $30 < C < 35$

Questão 7

Calcule o determinante da matriz abaixo e assinale a opção correta.

$$\begin{vmatrix} \log^3(x) & 1 & \log(x) & \log^2(x) \\ \log^3(y) & 1 & \log(y) & \log^2(y) \\ \log^3(z) & 1 & \log(z) & \log^2(z) \\ \log^3(w) & 1 & \log(w) & \log^2(w) \end{vmatrix}$$

- (A) $\log\left(\frac{zw^3}{xy^2}\right)$
(B) $\log\left(\frac{x}{y}\right) \cdot \log\left(\frac{z}{x}\right) \cdot \log\left(\frac{z}{y}\right) \cdot \log\left(\frac{w}{x}\right) \cdot \log\left(\frac{w}{y}\right) \cdot \log\left(\frac{w}{z}\right)$
(C) $\log\left(\frac{x}{y}\right) \cdot \log\left(\frac{z}{y}\right) \cdot \log\left(\frac{w}{x}\right) \cdot \log\left(\frac{w}{y}\right) \cdot \log\left(\frac{w}{z}\right) \cdot \log(xy)$
(D) $\log\left(\frac{y}{x}\right) \cdot \log\left(\frac{z}{x}\right) \cdot \log\left(\frac{z}{y}\right) \cdot \log\left(\frac{w}{x}\right) \cdot \log\left(\frac{w}{y}\right) \cdot \log\left(\frac{w}{z}\right)$
(E) $\log\left(\frac{x}{y}\right) \cdot \log\left(\frac{z}{x}\right) \cdot \log\left(\frac{z}{y}\right) \cdot \log\left(\frac{w}{x}\right) \cdot \log\left(\frac{y}{w}\right) \cdot \log\left(\frac{w}{z}\right)$

Questão 8

Um conjunto M contendo 5 elementos e um conjunto N contendo 10 elementos formam funções do tipo $f: M \rightarrow N$. É correto afirmar que a quantidade de funções não injetoras $f: M \rightarrow N$ é:

- (A) 30.240
(B) 69.760
(C) 72.608
(D) 75.808
(E) 100.000

Questão 9

Considere o número complexo $w = x + yi$ e seu conjugado $\bar{w}$. Assinale a opção que apresenta o complexo w que satisfaz a equação $\bar{w} = w^5$.

- (A) $w = \cos \frac{k\pi}{3} + i \sin \frac{k\pi}{3}, \forall k \in \mathbb{Z}$
(B) $w = \cos \frac{k\pi}{4} + i \sin \frac{k\pi}{4}, \forall k \in \mathbb{Z}$
(C) $w = \cos \frac{k\pi}{5} + i \sin \frac{k\pi}{5}, \forall k \in \mathbb{Z}$
(D) $w = 2\left(\cos \frac{k\pi}{3} + i \sin \frac{k\pi}{3}\right), \forall k \in \mathbb{Z}$
(E) $w = \cos \frac{2k\pi}{3} + i \sin \frac{2k\pi}{3}, \forall k \in \mathbb{Z}$

Questão 10

Considere a curva $y^2 = 9 - x$ e suas retas tangente e normal no ponto (5,2). Assinale a opção que apresenta corretamente a área aproximada do triângulo formado por essas retas e o eixo das ordenadas.

- (A) 10,31
(B) 20,62

- (C) 31,25
(D) 53,12
(E) 82,50

Questão 11

Um copo na forma de um cilindro circular reto, com altura medindo 13 cm e diâmetro da base medindo 6 cm, está com água até $\frac{3}{4}$ de sua altura. Assim, qual o maior ângulo em que é possível inclinar o copo sem derramar água?

- (A) $\arctg(4/13)$
(B) $\arctg(1/3)$
(C) $\arctg(6/13)$
(D) $\arctg(1/2)$
(E) $\arctg(13/12)$

Questão 12

Assinale a opção que apresenta o conjunto solução da equação $\frac{1}{2} \arctg(x) = \arctg\left(\frac{1-x}{1+x}\right)$, considerando suas condições de existência.

- (A) $\{-\frac{\sqrt{3}}{3}\}$
(B) $\{-\sqrt{2}\}$
(C) $\{\frac{\sqrt{3}}{3}\}$
(D) $\{-\frac{\sqrt{3}}{3}, \frac{\sqrt{3}}{3}\}$
(E) $\{-\frac{\sqrt{2}}{3}, \frac{\sqrt{2}}{3}\}$

Questão 13

Considere os conjuntos numéricos A, B e C definidos abaixo.

$$A = \{x \in \mathbb{R}; f(x) = \log_{\frac{2x-3}{x}}(x) \text{ é uma função decrescente}\}$$

$$B = \text{Domínio}\{g(x) = \arcsen\left(\frac{x-1}{x}\right)\}$$

$$C = \{x \in \mathbb{R}; \frac{3x-4}{1-x} \leq -2\}.$$

Determine o conjunto $(B - A) \cap C$ e assinale a opção correta.

- (A) $[\frac{1}{2}, \frac{3}{2}] \cup]3, +\infty[$
(B) $[\frac{1}{2}, 1] \cup [2, +\infty[$
(C) $[-\infty, 1] \cup [2, 3[$
(D) $[\frac{1}{2}, 1[\cup [3, +\infty[$
(E) $[\frac{1}{2}, 1[\cup [\frac{3}{2}, 3]$

Questão 14

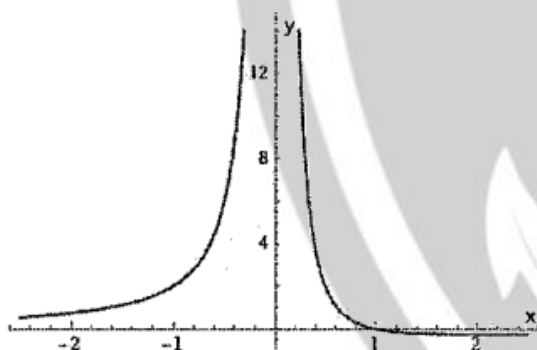
Um triângulo ABC, reto em $\hat{B}$, é tal que a bissetriz de $\hat{A}$ encontra a altura relativa à hipotenusa $\overline{BH}$, no ponto E. Sabe-se que $\overline{BC}$ e $\overline{BE}$ medem 7 cm e 3 cm, respectivamente. Determine a medida do raio do círculo inscrito no triângulo ABC e assinale a opção correta.

- (A) $\frac{3-\sqrt{3}}{2}$
- (B) $\frac{5-\sqrt{5}}{2}$
- (C) $\frac{7-\sqrt{7}}{2}$
- (D) $\frac{11-\sqrt{11}}{2}$
- (E) $\frac{13-\sqrt{13}}{2}$

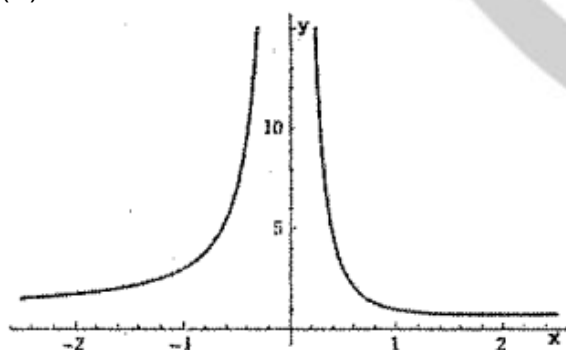
Questão 15

Assinale a opção que apresenta o gráfico da função $f: \mathbb{R}^* \rightarrow \mathbb{R}$ definida por $f(x) = \frac{x^5 - x + 1}{x^2}$.

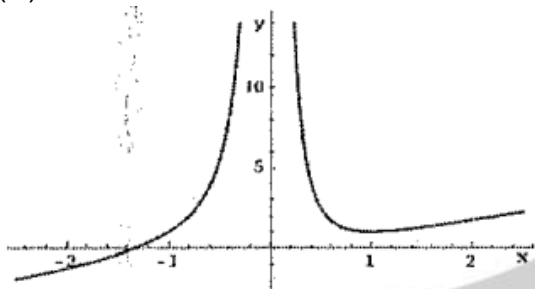
(A)



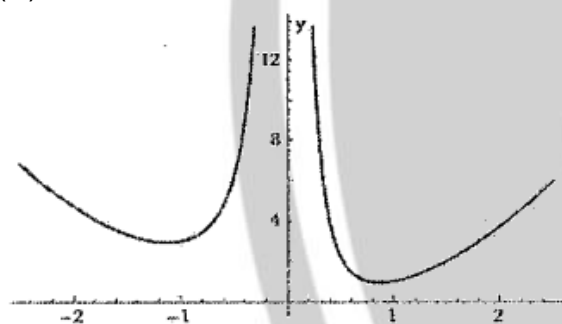
(B)



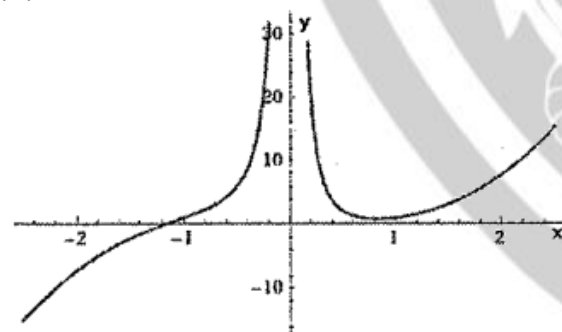
(C)



(D)



(E)



Questão 16

Sejam A e B matrizes quadradas de tamanho 2024×2024 , com entradas reais, invertíveis e diferentes da matriz identidade I. Suponha que $A^4 = I$ e $ABA^{-1} = B^2$. Assinale a opção que apresenta o menor número natural n tal que $B^n = I$.

- (A) 4
- (B) 8
- (C) 15
- (D) 16
- (E) 30

Questão 17

Um físico convida seus alunos para realizar um experimento no laboratório de mecânica e leva consigo duas caixinhas idênticas, uma em cada bolso, contendo barrinhas de alumínio idênticas. Para fazer o experimento, o professor toma uma barrinha de uma das caixinhas, a qual é escolhida aleatoriamente. Inicialmente, cada caixinha contém exatamente "n" barrinhas, as quais vão sendo, sucessivamente, usadas e descartadas. Como o físico tem um grau acentuado de distração, há um momento em que tira uma das caixinhas de um dos bolsos e percebe-a vazia. Neste momento, qual é a probabilidade de que a outra caixa contenha exatamente k barrinhas?

- (A) $\frac{(2n-k)!}{(n-k)! 2^{2n-k}}$
(B) $\frac{(2n-k)!}{n! (n-k)! 2^{2n}}$
(C) $\frac{(2n-k)!}{n! (n-k)! 2^{2n-k}}$
(D) $\frac{(2n-k)!}{n! (n-k)! 2^k}$
(E) $\frac{(n-k)!}{n! (n-k)! 2^{2n-k}}$

Questão 18

$P(x)$ é um polinômio de grau 6 que satisfaz a $P(1) = P(2) = P(3) = P(4) = P(5) = P(6) = -3$ e $P(-1) = 3$. Assinale a opção correta a respeito de $P(-2)$.

- (A) $P(-2) = 12$
(B) $P(-2) = 15$
(C) $P(-2) = 18$
(D) $P(-2) = 21$
(E) $P(-2) = 24$

Questão 19

Considere o plano $\pi: 2x + y + z - 6 = 0$ e os pontos $P(4,1,-2)$ e $O\left(\frac{13}{3}, \frac{5}{3}, \frac{-7-\sqrt{6}}{3}\right)$. Seja $P'(a,b,c)$ simétrico a P em relação a π . Assinale a opção que apresenta corretamente o valor do ângulo, em radianos, formado pelos vetores $\overrightarrow{OP'}$ e $\vec{u} = (\sqrt{2}, \sqrt{2}, -2\sqrt{3})$.

- (A) $\frac{5\pi}{6}$
(B) $\frac{2\pi}{3}$
(C) $\frac{\pi}{2}$
(D) $\frac{\pi}{3}$
(E) $\frac{\pi}{6}$

Questão 20

Simplifique a expressão abaixo, considerando $\sin x \cos x \neq 0$, e assinale a opção correta.

$$\frac{[\cos^2 \theta + \cos^2(x + \theta) - 2\cos x \cos \theta \cos(x + \theta)]}{\sin x \cos x}$$

- (A) $\operatorname{tg} x$
- (B) $\operatorname{cotg} x$
- (C) $\cos x$
- (D) $\sec x$
- (E) $\operatorname{cosec} x$

Questão 21

Sabendo que $s = \log_2 a + \log_2 2a + \log_2 4a + \dots + \log_2 1024a$, calcule a de modo a obter $S = 121$ e assinale a opção correta.

- (A) 1
- (B) 64
- (C) 256
- (D) 1024
- (E) 2048

Questão 22

Sabendo que:

$$I = \int \cos(1537x) \cos(487x) dx,$$

$$W = \int \sin(1499x) \sin(525x) dx \text{ e}$$

$$Z = \int [\cos(974) - \cos(1050x)] dx,$$

Simplifique a expressão $I - W + \frac{Z}{2}$ e assinale a opção correta.

- (A) $-2024 \sin(2024x) + c$
- (B) $2024 \sin(2024x) + c$
- (C) $2024 \cos(2024x) + c$
- (D) $\frac{\cos(2024x)}{2024} + c$
- (E) $\frac{\sin(2024x)}{2024}$

TEXT I

Read the text below and answer questions 23 to 27.

Wind-powered cargo ships with sail-like 'wings' could reduce fuel use by 30%

- [1] A cargo ship with a difference is set to dock at the Polish port of Gdynia early next week.
- [2] The Pyxis Ocean, a bulk carrier that is 229 meters long and 32 meters wide, looks like any other dry cargo vessel - but with a big difference: it is fitted with two large, rigid sails known as WindWings.
- [3] These 37.5-meter-tall wings use wind power to help propel the vessel and in doing so reduce the amount of fuel it uses in an effort to cut carbon - shipping accounts for nearly 3% of the world's greenhouse gas emissions.
- [4] The ship set sail from Shanghai, China, on Aug. 1, with around 20 crew onboard, and the voyage took it to Paranagua, Brazil, in September before it set sail for the Spanish island of Tenerife, and then on to Poland. The wings were folded down when the ship docked at ports on the journey.
- [5] The WindWings were added to the six-year-old vessel with the aim of cutting fuel use by about 20% on the voyage, according to Jan Dieleman, president of Cargill Ocean Transportation, which chartered the Pyxis Ocean.

Net zero goals

- [6] Cargill's calculations suggest that WindWings could contribute to around a 30% reduction in fossil fuel consumption when three wings are installed on a new ship - but if that vessel is powered with a biofuel, that figure could go up to 50%, Dieleman said.
- [7] In July, the maritime industry agreed to reduce emissions to net zero "by or around" 2050, but given the size and complexity of the sector, issues such as a lack of green fuels could cause delays.
- [8] "Wind is not going to get us to zero - unless we're all willing to switch off the engines and go back in time... But what we're trying to do here with this specific technology is somehow combine the best of both worlds, still have reliability [with an engine], but reduce significantly the fuel usage," Dieleman told CNBC by video call.
- [9] Biofuels such as green methanol and green ammonia are more costly than fossil fuels, and it's not simply a case of switching one for another: methanol has about half the energy density of hydrocarbons so need larger tanks, for example.
- [10] "If you can reduce the volume [of fuel] you have another gain, [in] that you don't have to put your ship all full of tanks instead of cargo capacity," Dieleman said.
- [11] "I do get very excited with the combination of wind plus the new fuels, because new fuels [are] three, four times more expensive, then [by adding wind power] your payback is probably going to be two, three years instead of 10 years," he added. This might encourage more ship owners to participate in schemes like this, because they are potentially more financially rewarding and less risky, Dieleman said.
- [12] Cargill has ordered five methanol-powered bulk carrier vessels, the first of which was ordered in 2022, before the WindWings were tested at sea. Once the wings' performance has been evaluated, Cargill hopes to work with the shipyard building the new vessels to add WindWings to their design.
- [13] The WindWings are not suitable for all vessels: it wouldn't be possible to install them on a cargo ship that carries large containers that are many layers tall, for example. Bulk carriers like the Pyxis Ocean store their goods- such as grain - inside their cavities, below deck.

[14] The WindWings were developed by Cargill with naval architect Bar Technologies, and produced by Yara Marine Technologies, while the Pyxis Ocean is owned by Mitsubishi Corporation.

[15] "This is a prime example, I think, of where people come together, and really genuinely [are] willing to make a difference, taking some risk. We have an owner that is letting us cut big holes in the ship - that is not what every owner in the world is willing to do," Dieleman said.

(Adapted from <https://www.cnn.com>)

Glossary

- "Net zero" refers to the balance between the amount of greenhouse gas that is produced and the amount that is removed from the atmosphere.

Questão 23

The verb "dock" in the sentence "A cargo ship with a difference is set to dock at the Polish port of Gdynia early next week." (paragraph 1) is equivalent in meaning to:

- (A) start.
- (B) sink.
- (C) set off.
- (D) leave.
- (E) arrive.

Questão 24

Which option is correct according to text I?

- (A) Jan Dieleman recommends that shipping companies should switch off the engines of ships and go back in time in order to obtain net zero emissions.
- (B) The present use of biofuels alone only brings advantages to shipping companies.
- (C) Although new fuels are more expensive and may have lower energy density, ships that use them together with wind power may be more financially rewarding.
- (D) The fossil fuel industry is a promising activity which has been attracting ship owners in spite of the financial risks involved.
- (E) Cargill intends to buy ships of all kinds and add WindWings to them.

Questão 25

The word "so" in the sentence "These 37.5-meter-tall wings use wind power to help propel the vessel and in doing so reduce [...]" (paragraph 3) refers to:

- (A) "is 229 meters long and 32 meters wide" (paragraph 2).
- (B) "use wind power to help propel the vessel" (paragraph 3).
- (C) "looks like any other dry cargo vessel" (paragraph 2).
- (D) "reduce the amount of fuel it uses in an effort to cut carbon" (paragraph 3).
- (E) "accounts for nearly 3% of the world's greenhouse gas emissions" (paragraph 3).

Questão 26

The phrase "set sail" (paragraph 4) is equivalent in meaning to:

- (A) flew.
- (B) boarded.
- (C) departed.
- (D) fitted.
- (E) reduced.

Questão 27

According to text I:

- (A) the Pyxis Ocean is a brand new ship which was fitted with two WindWings with the purpose of consuming approximately 20% less fuel.
- (B) the Pyxis Ocean is an old ship which was fitted with three WindWings with the purpose of consuming approximately 20% less fuel.
- (C) the greenhouse gas emissions in the world are heavily caused by the shipping industry.
- (D) ships that have three WindWings and use biofuel may consume 50% less in fuel.
- (E) ships that have three WindWings and use biofuel will consume up to 30% less in fuel.

TEXT II

Read the text below and answer questions 28 and 29.

Why We're Spending So Much Money

[1] My credit card seldom leaves my wallet anymore. But that doesn't matter. In the two weeks before I wrote this story, I spent more than \$4,000 on my card without laying eyes on it.

[2] Each of these transactions was made online, where my card number is stored by Uber or Walmart or Google Chrome. That's probably why I didn't feel embarrassed when I spent \$333 on groceries for a weekend with friends, or \$48.34 on a pizza through Uber Eats, or even \$1,533 for an Airbnb. Without having to type in my card number, the pain of the purchase was softened.

[3] Frictionless transactions are common in today's economy - you can wave your cell near a cash register, press "buy" on Amazon without really knowing which credit card you're charging, and send money to a stranger via your phone without having met them in person.

[4] There are, of course, some reasons why people are spending a lot of money right now. But there's one additional factor that has changed since the beginning of the pandemic: people are more accustomed to using financial technology to pay for things, which eliminates barriers that might have once slowed their spending. "Convenience makes it much easier to enjoy the process of shopping, removing the additional difficulties of buying things," says Yuqian Xu, a professor at UNC's Kenan-Flagler Business School who has studied frictionless payment methods. Research shows that the more frictionless the payment method, the more money people spend.

[5] Paying with a mobile phone is faster than using a credit card - it takes an average of 29 seconds versus 40, according to Xu, the UNC professor. That speed and convenience accelerates spending, Xu and her colleagues found in a July 2023 study that tracked spending after the launch of Alipay, a mobile payment service. It indicated that credit card transaction amounts increased by 9.4% once people could use a mobile device, while the frequency of transactions increased by 10.7%.

[6] The result is a cycle of tech adoption that has loosened customers' wallets. Once consumers started using mobile payments, they became more comfortable with making credit-card payments on their computers, and started moving more money digitally. And once they were comfortable spending money digitally, they started spending more money overall.

[7] Economists refer to the way people organize and spend their money as mental accounting. Humans are often irrational with the way they choose to spend and save money - splurging with a \$100 bill found on the sidewalk while saving every penny of their salary, for instance.

[8] Mental accounting is a big reason people spend more with frictionless payments. Consumers think of new apps like Apple Pay as a separate budget category that enables new spending, says Michael Gelman, a finance professor at the University of Delaware. In an experiment, Gelman tracked the behavior of consumers who had received a random credit card in the mail. While those consumers' spending behavior on their old credit cards remained the same, they started to splurge on their new one, dropping 26% more than people who had not received a new card. "Once you open a new budget category, you manage it separately," he says. "It can have an effect on total consumption: you consume more because you have the opportunity."

[9] But many American consumers are spending beyond their means. Household debt reached a record \$17.5 trillion in the fourth quarter of 2023, and has increased by \$3.4 trillion since the end of 2019, according to data from the Federal Reserve Bank of New York. Credit card debt has "passed a milestone," says Michele Raneri, head of U.S. research and consulting at TransUnion.

[10] That's partly because people have a hard time keeping track of all the places they're spending money, credit counselors say. The rise of digital payment systems like Apple Pay "creates this scattered universe of different payment options that can lead to overspending and financial instability," says Bruce McClary, senior vice president at the National Foundation for Credit Counseling.

(Adapted from <https://time.com>)

Questão 28

According to text II:

- (A) the use of mobile phones for online shopping leads to people feeling more comfortable and, consequently, more conscious of their payments.
- (B) nowadays there are no more barriers that prevent people from spending all their money.
- (C) the use of mobile devices for buying things online has led to an increase in people's spending money.
- (D) the technologies used in frictionless transactions allow people to video message strangers whenever they ask for money.
- (E) the convenience of mobile payments has made it easier for people to save money.

Questão 29

Because of their mental accounting, the general public often associates frictionless payments with:

- (A) American consumers' behavior.
- (B) buying less.
- (C) throwing away their old credit cards.
- (D) a separate budget category.
- (E) saving more money.

Questão 30

Mark the option that is grammatically correct.

- (A) Africa is more larger than Europe.
- (B) Mexico isn't as larger as Brazil.
- (C) Europe isn't the more populous continent in the world.
- (D) Argentina is least populous then Brazil.
- (E) Asia is the largest continent in the world.

Questão 31

Analyze the sentences below.

- I- The attendant refused to help me yesterday.
- II- They expect arriving there in an hour.
- III- You should to avoid drinking cold water.
- IV- I always forget to lock the door.
- V- We enjoyed visiting the museum last month.

Choose the correct option.

- (A) Only I, II and III are grammatically correct.
- (B) Only II, III and IV are grammatically correct.
- (C) Only III and IV are grammatically correct.
- (D) Only I, IV and V are grammatically correct.
- (E) Only II and V are grammatically correct.

Questão 32

Mark the option that is grammatically correct.

- (A) The passengers would survive the accident if they wear life jackets.
- (B) Unless my train is late, I'd arrive early.
- (C) Unless they'll follow the appropriate procedures, a fire breaks out.
- (D) Oil floats if you pour it on water.
- (E) If the engine stops, the ship would drift.

Questão 33

Which option completes the text below correctly?

My husband and I _____ at the airport last Thursday when we _____ that we _____ our passports at home. Fortunately, we _____ very early at the airport so we _____ time to go back home. We _____ our passports, _____ back to the airport and could finally _____ the plane.

- (A) checked in / had realized / were leaving / arrived / have had / get/ hurry / gotten on
- (B) was checking in / realized / had have had / got/ hurry / get on left / had arrived /
- (C) were checking in / realized / had left / had arrived / had / got / hurried / get on
- (D) was checking in / had realized / left / arrived / had / gotten / had hurried / got on
- (E) were checking in / had realized / left / arrived / had / gotten / hurried / got on

Questão 34

Mark the option that is grammatically correct.

- (A) You're Peter Jackson, don't you?
- (B) The class finishes before lunch, doesn't it?
- (C) The animals in the zoo are fed twice a day, didn't they?
- (D) You can't speak French, could you?
- (E) Let's go out, have we?

Questão 35

Read the text below.

Sleep hygiene is one of the factors that can help to boost muscle recovery. Most of the body recuperation takes place during sleep. According to a study, lack of sleep can reduce muscle growth and lead to muscle loss. Also, a single sleepless night can affect your performance during an exercise or a workout. _____, you should ensure that you sleep well to get the most out of your training. Make sure you sleep up to seven hours every night. Sleeping for eight to nine hours is preferable if you engage in a rigorous workout.

(Adapted from <https://www.briancolemnd.com>)

Which option completes the text correctly?

- (A) Despite
- (B) Although
- (C) Because
- (D) As though
- (E) Therefore

Questão 36

Which option completes the sentence below correctly?

After _____ an ankle injury, the runner won a gold medal.

- (A) getting over
- (B) staying up

- (C) switching on
- (D) eating out
- (E) writing down

Questão 37

Choose the correct option to complete the dialogue below.

Captain: _____ you join the Navy?

Sailor: Two years ago, sir.

- (A) When did
- (B) When were
- (C) Where did
- (D) How long was
- (E) How long were

Questão 38

Which sentence is grammatically INCORRECT?

- (A) The ship will be launched soon.
- (B) Ships used to been build of wood.
- (C) Nowadays ships are made of steel.
- (D) The ship was bought by our company.
- (E) Our ship is being painted now.

Questão 39

Which option completes the sentence below correctly?

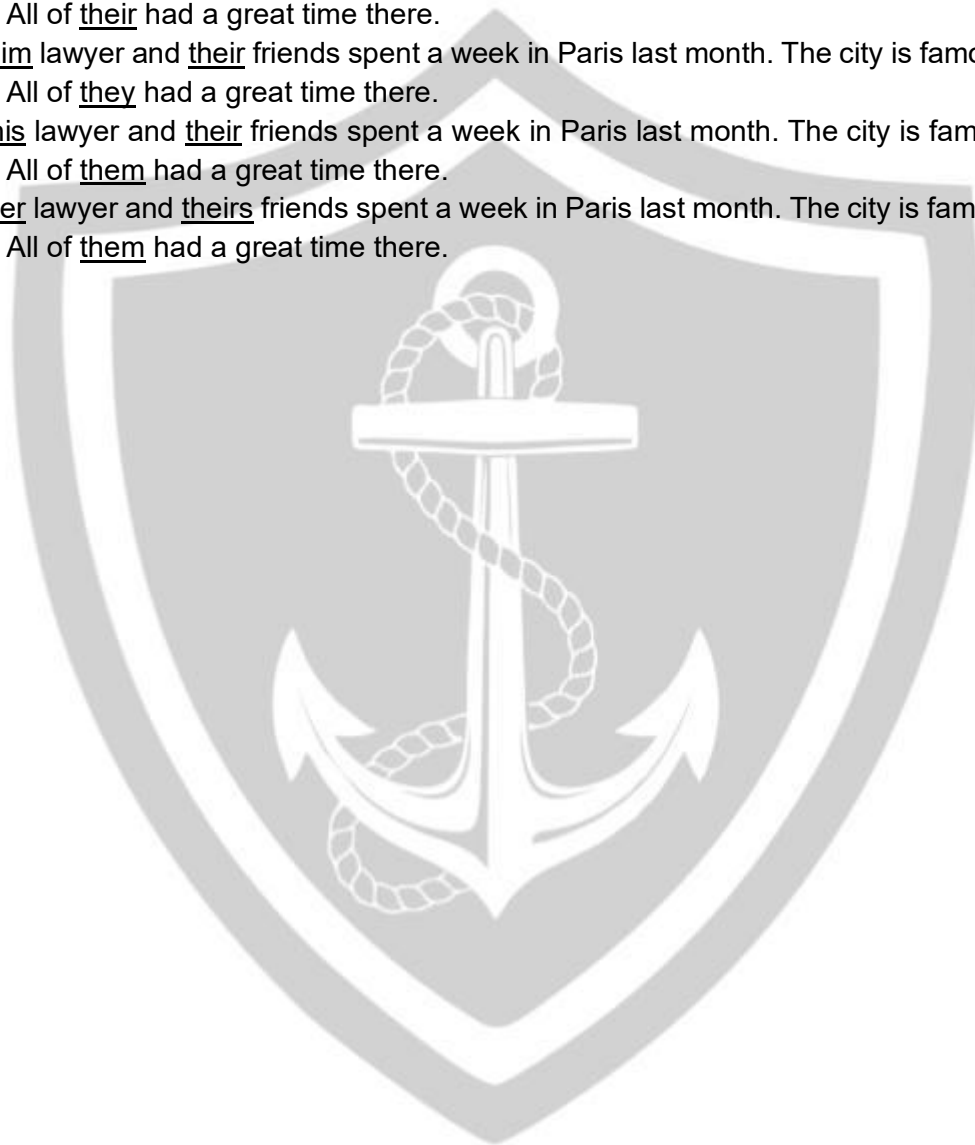
As it was a cold day, _____ people were on the deck of the ship.

- (A) few
- (B) much
- (C) a lot
- (D) none
- (E) a little

Questão 40

Mark the option in which the underlined words are correctly used.

- (A) Mr. Adams, his lawyer and their friends spent a week in Paris last month. The city is famous for it's fashion, food and culture. All of they had a great time there.
- (B) Mr. Adams, her lawyer and theirs friends spent a week in Paris last month. The city is famous for its fashion, food and culture. All of their had a great time there.
- (C) Mr. Adams, him lawyer and their friends spent a week in Paris last month. The city is famous for her fashion, food and culture. All of they had a great time there.
- (D) Mr. Adams, his lawyer and their friends spent a week in Paris last month. The city is famous for its fashion, food and culture. All of them had a great time there.
- (E) Mr. Adams, her lawyer and theirs friends spent a week in Paris last month. The city is famous for it's fashion, food and culture. All of them had a great time there.



Gabarito

Matemática

- 1- B
- 2- E
- 3- B
- 4- A
- 5- D
- 6- D
- 7- B
- 8- B
- 9- Anulada
- 10- D
- 11- E
- 12- C
- 13- Anulada
- 14- C
- 15- E
- 16- C
- 17- C
- 18- D
- 19- A
- 20- A
- 21- B
- 22- E

Inglês

- 23- E
- 24- C
- 25- B
- 26- C
- 27- D
- 28- C
- 29- D
- 30- E
- 31- D
- 32- D
- 33- C
- 34- B
- 35- E
- 36- A
- 37- A
- 38- B
- 39- A
- 40- D