SUJET D'ENTRAÎNEMENT À IMPRIMER

Test Bocconi Bachelor : 50 questions en 75 minutes

Sujet original rédigé par France Prépa, au format publié par l'Università Bocconi : 24 questions de mathématiques, 11 de compréhension écrite, 6 de raisonnement numérique et 9 de pensée critique, dans un ordre mélangé.

50	75	+1	−0,2
QUESTIONS	MINUTES	BONNE RÉPONSE	PAR ERREUR

- Travaillez sans calculatrice, avec du papier et un stylo, sans interruption.
- Une question sans réponse vaut 0. Une erreur coûte 0,2 point, ou 0,33 point sur les questions à trois réponses.
- En dessous de 17 points sur 50, pénalités comprises, la Bocconi n'examine pas la candidature.
- Reportez vos réponses sur la grille de la dernière partie, puis comptez votre score avec les réponses en fin de document.
- Le corrigé expliqué des 50 questions, en français, se trouve à la fin du document. Le même test se passe aussi en ligne, avec chronomètre : bocconi-admission.com/ressources/test-complet-bachelor/

Les 50 questions

1. MATHEMATICS

If $2(3x - 4) = 5x + 7$, what is the value of x?

A. 1
B. −1
C. 7.5
D. 3
E. 15

2. MATHEMATICS

The equation $x^2 - 5x - 14 = 0$ has two solutions. What is the sum of their squares?

A. 25
B. 53
C. 81
D. 29
E. 45

3. MATHEMATICS

What is the value of $(2^5 \times 4^3) / 8^2$?

A. 64
B. 32
C. 128
D. 16
E. 8

4. MATHEMATICS

Which value of x satisfies $\log_2(x) + \log_2(x - 2) = 3$?

A. −2
B. 4
C. 8
D. 6
E. 2

5. MATHEMATICS

Let $f(x) = 3x - 2$ and $g(x) = x^2 + 1$. What is $f(g(2))$?

A. 11
B. 17
C. 13
D. 25
E. 15

6. MATHEMATICS

A line passes through the points (1, 2) and (4, 11). What is its y-intercept?

A. 1
B. −1
C. 2
D. −3
E. 3

> **PASSAGE 1**
>
> When households and firms expect prices to rise, they tend to act in ways that make the rise more likely. Workers ask for higher wages, firms raise their prices in advance, and savers move money out of cash. For this reason, many central banks pay as much attention to expected inflation as to current inflation. A central bank that is believed when it announces a target of 2% can keep inflation close to that level with relatively small changes in interest rates. One that has lost its credibility must raise rates much further, at a greater cost to employment, to obtain the same result. Credibility, however, is slow to build and quick to lose: a single period in which the bank tolerates high inflation may shift expectations for years.

7. READING COMPREHENSION

Which of the following best states the main idea of the passage?

A. Savers are the group most harmed by rising prices
B. Expectations of inflation influence actual inflation, which is why a central bank's credibility matters
C. A 2% inflation target is too low for most economies
D. Inflation is mainly caused by workers asking for higher wages
E. Central banks should always keep interest rates as low as possible

8. READING COMPREHENSION

According to the passage, a central bank that is believed by the public

A. must raise rates further than other central banks
B. can keep inflation near its target with smaller changes in interest rates
C. no longer needs to change interest rates
D. should announce a higher inflation target
E. can ignore current inflation

9. READING COMPREHENSION

The phrase "at a greater cost to employment" suggests that

A. sharp increases in interest rates tend to reduce employment
B. higher employment always causes inflation
C. credible central banks create more jobs than governments
D. central banks are responsible for setting wages
E. unemployment has no link with interest rates

10. READING COMPREHENSION

With which of the following statements would the author most likely agree?

A. Credibility can be rebuilt within a few weeks
B. Expected inflation matters less than current inflation
C. Firms never raise prices before their costs increase
D. Tolerating high inflation, even for a short time, can have lasting consequences
E. Interest rates have no effect on inflation

11. MATHEMATICS

What is the distance between the points $(-2, 3)$ and $(4, -5)$?

A. $2\sqrt{7}$
B. 10
C. 14
D. 8
E. $\sqrt{28}$

12. MATHEMATICS

What is the radius of the circle $x^2 + y^2 - 6x + 4y - 12 = 0$?

A. $\sqrt{13}$
B. 5
C. $\sqrt{12}$
D. 6
E. 25

13. MATHEMATICS

A right triangle has legs of length 9 and 12. What is the length of the altitude drawn to the hypotenuse?

A. 8
B. 7.2
C. 6
D. 10.5
E. 7.5

14. MATHEMATICS

If $\sin\theta = 3/5$ and θ lies in the second quadrant, what is $\tan\theta$?

A. $-4/3$
B. $3/4$
C. $-4/5$
D. $4/3$
E. $-3/4$

15. MATHEMATICS

In a group of 120 students, 70 study economics, 55 study law and 20 study neither. How many study both subjects?

A. 15
B. 45
C. 25
D. 35
E. 5

16. MATHEMATICS

In an arithmetic sequence, the 3rd term is 11 and the 8th term is 31. What is the 20th term?

A. 83
B. 80
C. 91
D. 79
E. 75

TABLE A. SALES BY REGION, IN MILLIONS OF EUROS

Region	2023	2024
North	120	138
South	80	76
East	50	65
West	150	156
Total	**400**	**435**

17. NUMERICAL REASONING

Which region recorded the highest percentage growth in sales between 2023 and 2024?

A. North
B. West
C. South
D. East
E. North and East, equally

18. NUMERICAL REASONING

Approximately what share of total sales did the West region represent in 2024?

A. 38%
B. 30%
C. 36%
D. 40%
E. 33%

19. NUMERICAL REASONING

If sales in the South had grown at the same rate as in the North, what would total sales have been in 2024, in millions of euros?

A. 439
B. 447
C. 455
D. 463
E. 451

20. CRITICAL THINKING

All managers at a firm speak English. Some managers speak Italian. No intern is a manager.

Which of the following must be true?

A. Some people at the firm who speak Italian also speak English
B. No intern speaks English
C. Some interns speak Italian
D. All managers speak Italian
E. Everyone who speaks English is a manager

21. CRITICAL THINKING

Five candidates, A, B, C, D and E, are ranked with no ties. A is ranked higher than B. B is ranked higher than D. C is ranked lower than D. E is not ranked last.

Which of the following must be true?

A. A is ranked first
B. E is ranked first
C. C is ranked last
D. D is ranked third
E. E is ranked higher than B

22. CRITICAL THINKING

If the central bank raises interest rates, the currency appreciates. If the currency appreciates, exports fall. Exports did not fall.

Which conclusion follows?

A. The central bank did not raise interest rates
B. The currency appreciated
C. Nothing can be concluded about interest rates
D. The central bank raised interest rates
E. Exports increased

23. CRITICAL THINKING

In a class of 30 students, every student takes at least one of Mathematics and Economics. 18 take Mathematics and 20 take Economics.

Which of the following must be true?

A. At most 6 students take both subjects
B. More students take only Mathematics than only Economics
C. Exactly 10 students take only Economics
D. Exactly 8 students take both subjects
E. Exactly 12 students take only Mathematics

24. MATHEMATICS

A geometric sequence has first term 3 and common ratio 2. What is the sum of its first 6 terms?

A. 192
B. 93
C. 189
D. 96
E. 381

25. MATHEMATICS

A committee of 3 people is chosen from 5 women and 4 men. How many different committees contain exactly 2 women?

A. 60
B. 30
C. 20
D. 40
E. 84

26. MATHEMATICS

Two fair dice are rolled. What is the probability that the sum of the two numbers is 8?

A. 1/9
B. 1/6
C. 5/36
D. 1/12
E. 7/36

27. MATHEMATICS

A bag contains 5 red balls and 3 blue balls. Two balls are drawn without replacement. What is the probability that they are the same colour?

A. 13/28
B. 17/32
C. 5/14
D. 15/28
E. 1/2

28. MATHEMATICS

The mean of five numbers is 12. Four of them are 8, 15, 10 and 14. What is the median of the five numbers?

A. 10
B. 12
C. 13
D. 12.5
E. 14

29. MATHEMATICS

A price is increased by 25% and then reduced by 20%. Compared with the original price, the final price is

A. 5% higher
B. 2.5% higher
C. 5% lower
D. unchanged
E. 1% lower

> **PASSAGE 2**
>
> Digital platforms that connect two groups of users, such as drivers and passengers or sellers and buyers, benefit from what economists call network effects: each new user on one side makes the platform more attractive to users on the other side. Because of this, a platform that gains an early lead often keeps growing, while its rivals struggle to attract enough users to be useful. To reach that position, platforms frequently charge one group very little, or nothing at all, and earn their revenue from the other. Regulators face a dilemma. Low prices are good for consumers in the short run, but a market dominated by a single platform may later see higher fees, less innovation and fewer choices. Intervening too early, on the other hand, may punish a firm simply for being better than its competitors.

30. READING COMPREHENSION

According to the passage, a network effect exists when

A. a platform becomes more valuable to its users as more users join it
B. a platform earns revenue from both groups of users
C. users can easily switch from one platform to another
D. a platform lowers its prices to match its rivals
E. regulators limit the size of a platform

31. READING COMPREHENSION

Why do platforms often charge one group of users very little?

A. To attract enough users on that side to make the platform valuable to the other side
B. Because that group cannot afford to pay
C. To reduce the number of users and lower their costs
D. Because rivals have already set prices at zero
E. Because regulators require them to do so

32. READING COMPREHENSION

The dilemma faced by regulators is that

A. consumers prefer high prices and little choice
B. consumers benefit now from low prices, but dominance by one platform may harm them later
C. intervening early always improves innovation
D. network effects make platforms unprofitable
E. platforms refuse to share their data with public authorities

33. READING COMPREHENSION

It can be inferred from the passage that

A. a platform's early lead can be difficult for competitors to overcome
B. regulators have decided to break up dominant platforms
C. the first platform in a market always offers the best service
D. platforms without network effects cannot make a profit
E. users on both sides always pay the same price

TABLE B. ADMISSIONS TO THREE PROGRAMMES

Programme	Applicants	Admitted	Enrolled
A	2,000	400	300
B	1,500	450	270
C	800	200	180

34. NUMERICAL REASONING

Which programme has the highest admission rate (admitted divided by applicants)?

A. A and C, equally
B. B and C, equally
C. B
D. A
E. C

35. NUMERICAL REASONING

Across the three programmes, approximately what percentage of admitted students enrolled?

A. 64%
B. 71%
C. 79%
D. 68%
E. 75%

36. NUMERICAL REASONING

With its current admission rate, how many more applicants would programme C need in order to admit as many students as programme A?

A. 1,600
B. 400
C. 200
D. 1,200
E. 800

37. MATHEMATICS

How many integers x satisfy $|2x - 3| < 7$?

A. 7
B. 4
C. 5
D. 8
E. 6

38. MATHEMATICS

If $3x + 2y = 16$ and $x - y = 2$, what is the value of xy ?

A. 8
B. 6
C. 4
D. 10
E. 12

39. MATHEMATICS

What is the area of a sector of a circle of radius 6 with a central angle of 60° ?

A. 36π
B. 12π
C. 2π
D. 3π
E. 6π

40. MATHEMATICS

If $4^x = 8^{x-1}$, what is the value of x ?

A. -3
B. 2
C. 3/2
D. 3
E. 1

41. MATHEMATICS

What is the maximum value of the function $f(x) = -x^2 + 6x - 5$?

A. 3
B. 4
C. 9
D. 5
E. −5

42. MATHEMATICS

How many positive divisors does 72 have?

A. 9
B. 6
C. 8
D. 12
E. 10

> **TEXT**
>
> A retailer introduced a loyalty card in March. Over the following six months, cardholders spent on average 22% more per visit than non-cardholders. The retailer's total revenue for the period was unchanged compared with the same period a year earlier.

43. CRITICAL THINKING

Statement: "The loyalty card caused cardholders to spend more per visit."

A. True
B. False
C. Cannot be deduced from the text

44. CRITICAL THINKING

Statement: "During the six months, cardholders spent more per visit, on average, than non-cardholders."

A. True
B. False
C. Cannot be deduced from the text

45. CRITICAL THINKING

Statement: "The retailer's total revenue rose after the card was introduced."

A. True
B. False
C. Cannot be deduced from the text

> **TEXT**
>
> A city replaced 40% of its diesel buses with electric ones in 2024. Electric buses cost more to buy but less to run. The city's transport budget for 2025 is identical to that of 2024. Passenger numbers rose by 5% in 2024.

46. CRITICAL THINKING

Statement: "All of the city's buses are now electric."

A. True
B. False
C. Cannot be deduced from the text

47. CRITICAL THINKING

Statement: "Passenger numbers rose in 2024 because of the electric buses."

A. True
B. False
C. Cannot be deduced from the text

> **PASSAGE 3**
>
> For three decades, manufacturers moved production to wherever it was cheapest, building supply chains that stretched across several continents. The approach lowered costs, but it also made firms dependent on distant suppliers and on uninterrupted transport. Recent disruptions have led some companies to bring part of their production closer to home, or to keep larger stocks of key components. Both choices raise costs. Economists disagree about how far this movement will go: some see a lasting change in the way firms weigh cost against security of supply, while others expect that, once memories of the disruptions fade, the pressure to cut costs will again prevail.

48. READING COMPREHENSION

The main purpose of the passage is to

A. predict that supply chains will soon disappear
B. describe a change in how firms organise production and the debate about whether it will last
C. argue that firms should never produce abroad
D. show that keeping stocks is cheaper than importing
E. explain why transport costs have fallen over thirty years

49. READING COMPREHENSION

According to the passage, keeping larger stocks of key components

A. is illegal in most countries
B. makes firms more dependent on distant suppliers
C. is preferred by all economists
D. has no effect on a firm's costs
E. increases a firm's costs

50. READING COMPREHENSION

The economists mentioned last in the passage believe that

A. firms will permanently give priority to security of supply
B. production costs no longer matter to firms
C. the pressure to reduce costs will eventually bring back earlier practices
D. disruptions will become more frequent
E. governments will forbid long supply chains

Grille de réponses

Noircissez une seule case par question. Laissez la ligne vide si vous ne répondez pas.

1 A B C D E	2 A B C D E	3 A B C D E	4 A B C D E	5 A B C D E
6 A B C D E	7 A B C D E	8 A B C D E	9 A B C D E	10 A B C D E
11 A B C D E	12 A B C D E	13 A B C D E	14 A B C D E	15 A B C D E
16 A B C D E	17 A B C D E	18 A B C D E	19 A B C D E	20 A B C D E
21 A B C D E	22 A B C D E	23 A B C D E	24 A B C D E	25 A B C D E
26 A B C D E	27 A B C D E	28 A B C D E	29 A B C D E	30 A B C D E
31 A B C D E	32 A B C D E	33 A B C D E	34 A B C D E	35 A B C D E
36 A B C D E	37 A B C D E	38 A B C D E	39 A B C D E	40 A B C D E
41 A B C D E	42 A B C D E	43 A B C	44 A B C	45 A B C
46 A B C	47 A B C	48 A B C D E	49 A B C D E	50 A B C D E

Calcul du score. Bonnes réponses : ____ × 1 = ____

Erreurs sur les questions à cinq réponses : ____ × 0,2 = ____

Erreurs sur les 5 questions à trois réponses : ____ × 0,33 = ____

Score = bonnes réponses − pénalités = ____ / 50 (seuil officiel : 17)

Les réponses

Ne consultez cette page qu'après avoir terminé. Le raisonnement détaillé de chaque question est donné dans le corrigé expliqué, à la suite.

1 E	**2** B	**3** B	**4** B	**5** C	**6** B	**7** B	**8** B	**9** A	**10** D
11 B	**12** B	**13** B	**14** E	**15** C	**16** D	**17** D	**18** C	**19** E	**20** A
21 C	**22** A	**23** D	**24** C	**25** D	**26** C	**27** A	**28** C	**29** D	**30** A
31 A	**32** B	**33** A	**34** C	**35** B	**36** E	**37** E	**38** A	**39** E	**40** D
41 B	**42** D	**43** C	**44** A	**45** B	**46** B	**47** C	**48** B	**49** E	**50** C

Lire votre score. Moins de 17 : candidature non examinée. De 17 à 29 : dossier recevable. De 30 à 34 : niveau correct. De 35 à 39 : niveau solide. 40 et plus : excellent niveau. Seul le seuil de 17 est officiel, les autres repères sont ceux de France Prépa.

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Le corrigé expliqué

Pour chaque question : la bonne réponse, le raisonnement et, quand il y en a un, le piège à éviter.

1. Réponse E. On développe : $6x - 8 = 5x + 7$, donc $x = 15$.

2. Réponse B. $x^2 - 5x - 14 = (x - 7)(x + 2)$. Les solutions sont 7 et −2, et 49 + 4 = 53.

3. Réponse B. On écrit tout en puissances de 2 : $2^5 \times 2^6 / 2^6 = 2^5 = 32$.

4. Réponse B. $\log_2(x(x - 2)) = 3$ donne $x(x - 2) = 8$, soit $x = 4$ ou $x = -2$. Le logarithme impose x supérieur à 2 : il reste $x = 4$.

5. Réponse C. $g(2) = 5$, puis $f(5) = 15 - 2 = 13$. L'erreur classique est de calculer $g(f(2)) = 17$.

6. Réponse B. La pente vaut $(11 - 2) / (4 - 1) = 3$. Avec le point (1, 2) : $y = 3x - 1$. L'ordonnée à l'origine est −1.

7. Réponse B. Le texte part de l'effet des anticipations sur les prix, puis en tire l'importance de la crédibilité de la banque centrale. Les autres réponses reprennent un détail ou une idée absente du texte.

8. Réponse B. Le texte dit qu'une banque crédible maintient l'inflation près de sa cible « with relatively small changes in interest rates ». Petites variations ne veut pas dire aucune variation.

9. Réponse A. C'est une information implicite : si remonter davantage les taux coûte plus cher en emploi, c'est que de fortes hausses de taux pèsent sur l'emploi.

10. Réponse D. La dernière phrase l'affirme : une seule période de tolérance peut déplacer les anticipations pendant des années.

11. Réponse B. Écart horizontal 6, écart vertical 8 : la distance vaut $\sqrt{(36 + 64)} = \sqrt{100} = 10$.

12. Réponse B. On complète les carrés : $(x - 3)^2 + (y + 2)^2 = 12 + 9 + 4 = 25$. Le rayon vaut 5.

13. Réponse B. L'hypoténuse vaut 15. L'aire se calcule de deux façons : $9 \times 12 / 2 = 15 \times h / 2$, donc $h = 108 / 15 = 7{,}2$.

14. Réponse E. $\cos^2\theta = 1 - 9/25 = 16/25$. Dans le deuxième quadrant le cosinus est négatif : $\cos\theta = -4/5$, donc $\tan\theta = (3/5) / (-4/5) = -3/4$.

15. Réponse C. 100 étudiants suivent au moins une matière. 70 + 55 − 100 = 25 suivent les deux.

16. Réponse D. Entre le 3e et le 8e terme il y a 5 pas pour 20 : la raison vaut 4. Le 20e terme vaut $31 + 12 \times 4 = 79$.

17. Réponse D. Est : 15 / 50 = 30 %. Nord : 18 / 120 = 15 %. Ouest : 6 / 150 = 4 %. Sud : baisse de 5 %. Le Nord gagne le plus en valeur, mais l'Est gagne le plus en pourcentage.

18. Réponse C. 156 / 435 ≈ 0,359, soit environ 36 %. Attention à ne pas diviser par le total de 2023 (400), ce qui donnerait 39 %.

19. Réponse E. Le Nord a progressé de 15 %. Le Sud aurait atteint $80 \times 1{,}15 = 92$ au lieu de 76, soit 16 de plus : 435 + 16 = 451.

20. Réponse A. Les managers qui parlent italien parlent aussi anglais, puisque tous les managers parlent anglais. Rien n'est dit sur les langues des stagiaires.

21. Réponse C. On a l'ordre A, B, D, C. Le dernier est donc C ou E. Comme E n'est pas dernier, C l'est. La place de E reste libre : rien d'autre n'est certain.

22. Réponse A. On remonte la chaîne par contraposée : pas de baisse des exportations, donc pas d'appréciation, donc pas de hausse des taux. « Exports increased » va trop loin : elles ont pu rester stables.

23. Réponse D. 18 + 20 − 30 = 8 élèves suivent les deux. Il en reste 10 en maths seules et 12 en économie seule.

24. Réponse C. Somme $= 3 \times (2^6 - 1) / (2 - 1) = 3 \times 63 = 189$. Le 6e terme seul vaut 96.

25. Réponse D. On choisit 2 femmes parmi 5 (10 façons) et 1 homme parmi 4 (4 façons) : $10 \times 4 = 40$.

26. Réponse C. Les cas favorables sont (2,6), (3,5), (4,4), (5,3), (6,2) : 5 cas sur 36.

27. Réponse A. Paires possibles : 28. Deux rouges : 10 paires. Deux bleues : 3 paires. Probabilité : 13 / 28.

28. Réponse C. La somme vaut 60, le cinquième nombre est 60 − 47 = 13. Dans l'ordre : 8, 10, 13, 14, 15. La médiane est 13.

29. Réponse D. 1,25 × 0,80 = 1. Les deux variations se compensent exactement, ce que l'addition 25 − 20 ne montre pas.

30. Réponse A. C'est la définition donnée dans la première phrase : chaque nouvel utilisateur d'un côté rend la plateforme plus attractive pour l'autre côté.

31. Réponse A. Le texte relie ce choix de prix à l'objectif de prendre de l'avance (« To reach that position ») : il faut du monde d'un côté pour attirer l'autre.

32. Réponse B. Les deux branches du dilemme sont les prix bas d'aujourd'hui et les risques d'une domination future, avec le danger d'intervenir trop tôt.

33. Réponse A. Le texte dit qu'une plateforme en avance continue de croître pendant que ses rivales peinent à attirer assez d'utilisateurs. « Always » et « have decided » ne figurent nulle part.

34. Réponse C. A : 400 / 2 000 = 20 %. B : 450 / 1 500 = 30 %. C : 200 / 800 = 25 %.

35. Réponse B. Inscrits : 300 + 270 + 180 = 750. Admis : 400 + 450 + 200 = 1 050. 750 / 1 050 ≈ 71 %. Faire la moyenne des trois taux (75 %, 60 %, 90 %) donnerait 75 %, ce qui est faux.

36. Réponse E. C admet 25 % des candidats. Pour 400 admis il faut 400 / 0,25 = 1 600 candidats, soit 800 de plus qu'aujourd'hui.

37. Réponse E. $-7 < 2x - 3 < 7$ donne $-2 < x < 5$. Les entiers sont −1, 0, 1, 2, 3, 4 : il y en a 6.

38. Réponse A. $x = y + 2$, donc $3(y + 2) + 2y = 16$, soit $y = 2$ et $x = 4$. Le produit vaut 8.

39. Réponse E. 60° représente un sixième du disque : $36\pi / 6 = 6\pi$. 2π est la longueur de l'arc, pas l'aire.

40. Réponse D. En base 2 : $2^{2x} = 2^{3(x-1)}$, donc $2x = 3x - 3$ et $x = 3$.

41. Réponse B. Le sommet est en $x = -b / 2a = 3$, et $f(3) = -9 + 18 - 5 = 4$. 3 est l'abscisse du sommet, pas la valeur maximale.

42. Réponse D. $72 = 2^3 \times 3^2$. Le nombre de diviseurs vaut $(3 + 1) \times (2 + 1) = 12$.

43. Réponse C. Le texte constate un écart, pas une cause. Les clients qui dépensaient déjà davantage ont pu être les premiers à prendre la carte.

44. Réponse A. C'est exactement ce que dit le texte : 22 % de plus par visite en moyenne.

45. Réponse B. Le texte dit que le chiffre d'affaires de la période est resté inchangé par rapport à l'année précédente.

46. Réponse B. Seuls 40 % des bus diesel ont été remplacés : il reste donc des bus diesel.

47. Réponse C. Les deux faits se produisent la même année, mais le texte ne donne aucun lien de cause entre eux.

48. Réponse B. Le texte décrit le mouvement de relocalisation et de constitution de stocks, puis expose le désaccord des économistes sur sa durée.

49. Réponse E. « Both choices raise costs » : relocaliser comme stocker davantage coûte plus cher.

50. Réponse C. Le second groupe pense qu'une fois les perturbations oubliées, la pression sur les coûts reprendra le dessus.

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