ALBERTA MATH 30-2 · FINAL EXAM · 50 QUESTIONS

Final Exam — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 **Given U = {1, 2, …, 10} and B = {2, 3, 5, 7}, the complement of B is**

- A {2, 3, 5, 7}
- B {1, 4, 6, 8, 9}
- C {4, 6, 8, 9, 10}
- D {1, 4, 6, 8, 9, 10}

Understand It with Pulse | Flag a mistake

2 **The value of $_8C_3$ is**

- A 336
- B 24
- C 112
- D 56

Understand It with Pulse | Flag a mistake

3 **The odds against a horse winning a race are 7:3 . The probability that the horse wins the race is**

A $\frac{7}{10}$

B $\frac{3}{7}$

C $\frac{3}{10}$

D $\frac{7}{3}$

Understand It with Pulse | Flag a mistake

4 **The non-permissible values of $\frac{x + 2}{(x - 1)(x + 4)}$ are**

A $x \neq -1, x \neq 4$

B $x \neq 1, x \neq 4$

C $x \neq 1, x \neq -4$

D $x \neq -1, x \neq -4$

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5 **The y-intercept of the graph of f(x) = 3x³ + 2x² - x + 6 is**

Question 5

The y –intercept of the graph of $f(x) = 3x^3 + 2x^2 - x + 6$ is

A) 6 B) –6

C) 2 D) –1

- **A** 6
- **B** -6
- **C** 2
- **D** -1

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6 **A bacterial culture starts with 500 bacteria and doubles every hour. The number of bacteria after 4 hours is**

- **A** 2000
- **B** 4000
- **C** 8000
- **D** 16000

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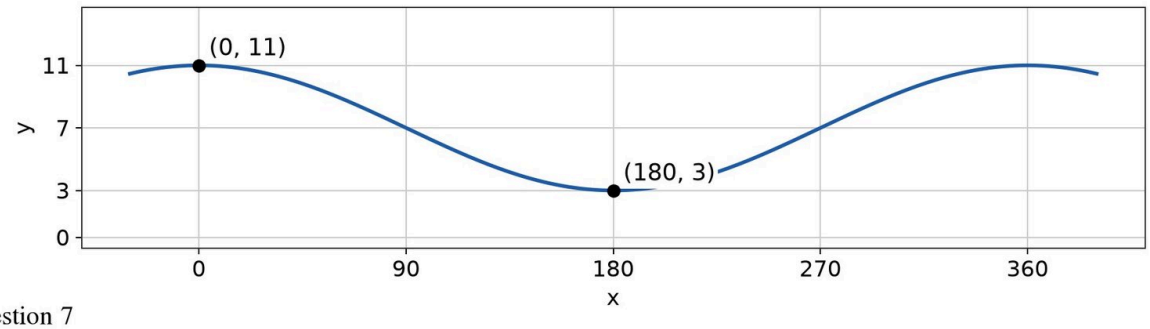
7

The graph below shows a sinusoidal function. The equation of the axis of the function is



Question 7

The graph below shows a sinusoidal function. The equation of the axis of the function is

A) $y = 14$

B) $y = 4$

C) $y = 3$

D) $y = 7$

A y = 14

B y = 4

C y = 3

D y = 7

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8 **For two sets A and B, n(A) = 31, n(B) = 20, and n(A ∩ B) = 8. The number of elements that are in A only is**

A 39

B 8

C 20

D 23

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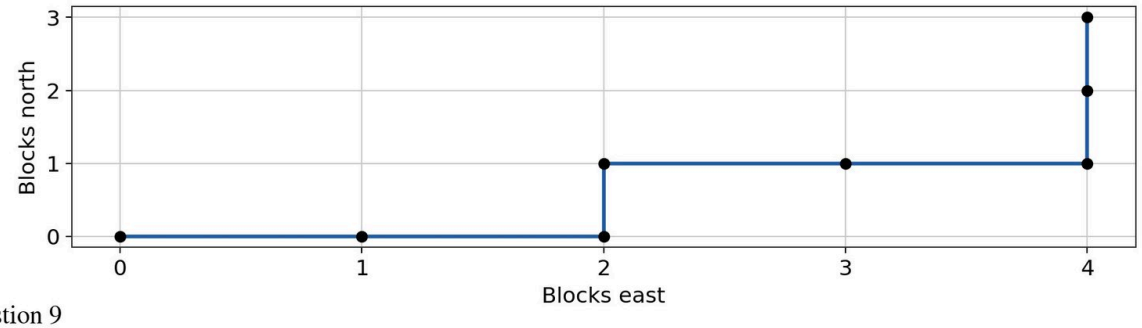
9

The graph below shows one route from home to school on a grid, moving only east or north. The number of different routes from the start of the shown route to its end is



Question 9

The graph below shows one route from home to school on a grid, moving only east or north. The number of different routes from the start of the shown route to its end is

A) 12

B) 210

C) 60

D) 35

A 12

B 210

C 60

D 35

Understand It with Pulse

Flag a mistake

10 **A bag contains 5 red marbles and 3 green marbles. Two marbles are drawn without replacement. The probability that both marbles are red is**

- **A** $\frac{5}{14}$
- **B** $\frac{25}{64}$
- **C** $\frac{5}{16}$
- **D** $\frac{3}{7}$

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11 **The difference $\frac{5x}{x+3} - \frac{2x}{x+3}$ is equal to**

- **A** $\frac{3}{x+3}$
- **B** $\frac{3x}{x+3}$
- **C** $\frac{7x}{x+3}$
- **D** $\frac{3x}{2x+6}$

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12 **A set of data is plotted, and the points rise, then fall, and then rise again, changing direction twice. The lowest degree of a polynomial function that models the data well is**

A 3

B 1

C 2

D 4

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13 **A radioactive substance has a half-life of 5 days. A sample starts with a mass of 640 g. The mass remaining after 15 days, in grams, is _____ Record your answer as a whole number.**

ANSWER _____

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14 **A sinusoidal function has a period of 45°. The value of b in the equation y = asin(bx) + d is ____ Record your answer as an integer.**

ANSWER _____

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15 **In a Venn diagram with three sets, the regions contain the following numbers of elements: A only 12, B only 9, C only 7, A and B only 5, A and C only 4, B and C only 3, all three sets 2, and none of the sets 6. The total number of elements in the universal set is ____ Record your answer as a whole number.**

Question 15

In a Venn diagram with three sets, the regions contain the following numbers of elements: A only 12, B only 9, C only 7, A and B only 5, A and C only 4, B and C only 3, all three sets 2, and none of the sets 6.

The total number of elements in the universal set is ____ Record your answer as a whole number.

ANSWER _____

Understand It with Pulse | Flag a mistake

16 **A diner offers 3 appetizers, 5 main courses, and 2 desserts. The number of different meals consisting of one appetizer, one main course, and one dessert is**

A 10

B 15

C 30

D 60

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17 **For two events A and B , P(A or B) = 0.8 , P(A) = 0.5 , and P(B) = 0.45 . The value of P(A and B) is**

A 0.15

B 0.25

C 0.05

D 0.95

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18 **The solution to the equation $\frac{2x - 3}{x + 1} = 3$ is**

A 0

B -6

C 6

D $-\frac{3}{2}$

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19

The graph of a cubic function has a local maximum value of 6 and a local minimum value of -3. The range of the function is

Question 19

The graph of a cubic function has a local maximum value of 6 and a local minimum value of -3. The range of the function is

A) $-3 \leq y \leq 6$

B) $y \geq -3$

C) $y \leq 6$

D) All real numbers

A -3 ≤ y ≤ 6

B y ≥ -3

C y ≤ 6

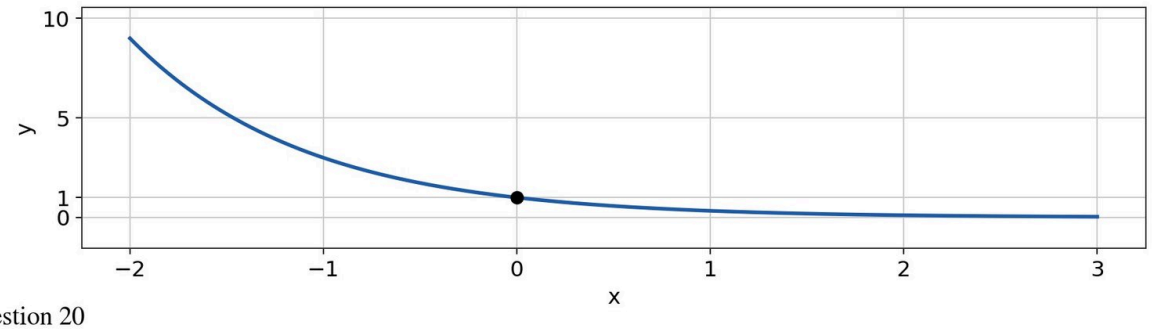
D All real numbers

Understand It with Pulse

Flag a mistake

20

The graph below shows an exponential function. The graph is best described as



Question 20

The graph below shows an exponential function. The graph is best described as

A) Increasing, with a y −intercept of 3

B) Decreasing, with a y −intercept of 1

C) Decreasing, with a y −intercept of 3

D) Increasing, with a y −intercept of 1

A Increasing, with a y-intercept of 3

B Decreasing, with a y-intercept of 1

C Decreasing, with a y-intercept of 3

D Increasing, with a y-intercept of 1

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21 The number of hours of daylight in a town is modelled by D(t) = 4.5sin(b(t - 80)) + 12, where t is the day of the year. The maximum number of hours of daylight is

- A 4.5
- B 7.5
- C 12
- D 16.5

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22 The set A ∩ B′ consists of the elements that are

- A in A or in B
- B in both A and B
- C in A but not in B
- D in neither A nor B

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23 **The number of different arrangements of all the letters in the word MISSISSIPPI is**

- A 34650
- B 69300
- C 831600
- D 39916800

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24 **Which pair of events is mutually exclusive?**

- A Drawing one card from a deck and getting a red card and a black card
- B Rolling a die and getting a prime number and an even number
- C Drawing one card from a deck and getting a king and a heart
- D Rolling a die and getting a 2 and an even number

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25 The difference $\frac{3}{x - 1} - \frac{x}{x^2 - 1}$ is equal to

A $\frac{2x - 3}{x^2 - 1}$

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

C $\frac{3 - x}{x - 1}$

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

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26 **A cubic function is used to model snowfall data collected from 2005 to 2020. The model is then used to predict the snowfall in 2035. This prediction is**

A Interpolation, and it is reliable

B Interpolation, and it is unreliable

C Extrapolation, and it is always accurate

D Extrapolation, and it may be unreliable

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27 **Which of the following functions represents exponential decay?**

- **A** $y = (1.04)^x$
- **B** $y = 2^x$
- **C** $y = (0.85)^x$
- **D** $y = x^2$

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28 **For the function y = 3sin(2(x - 45°)) + 5, the period and phase shift are**

- **A** Period: 90° Phase shift: 45° to the right
- **B** Period: 180° Phase shift: 45° to the left
- **C** Period: 360° Phase shift: 45° to the right
- **D** Period: 180° Phase shift: 45° to the right

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29 **An element x is in set A and set C, but not in set B. Which expression describes the region containing x?**

A $A \cap B \cap C$

B $A \cap C \cap B'$

C $A \cup C \cup B'$

D $(A \cap C)'$

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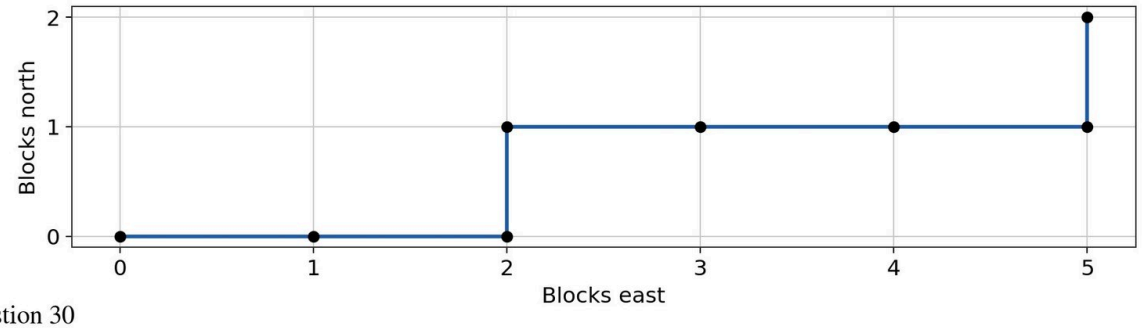
30

The graph below shows one route a courier takes on a grid, moving only east or north. The number of different routes from the start of the shown route to its end is



Question 30

The graph below shows one route a courier takes on a grid, moving only east or north. The number of different routes from the start of the shown route to its end is

A) 10

B) 21

C) 42

D) 35

A 10

B 21

C 42

D 35

Understand It with Pulse

Flag a mistake

31 A standard die is rolled once. The probability of rolling a number greater than 4 is

- **A** $\frac{1}{2}$
- **B** $\frac{1}{3}$
- **C** $\frac{2}{3}$
- **D** $\frac{1}{6}$

Understand It with Pulse | Flag a mistake

32 For the rational expression $\frac{3x}{x+5}$, the non-permissible value of x is

- **A** $x \neq 5$
- **B** $x \neq -5$
- **C** $x \neq 0$
- **D** $x \neq 3$

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33 The y-intercept of the graph of g(x) = -2x³ + x² + 5x - 9 is

Question 33

The y –intercept of the graph of $g(x) = -2x^3 + x^2 + 5x - 9$ is

A) 9

B) 5

C) –9

D) –2

A 9

B 5

C -9

D -2

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Flag a mistake

34 The value of $\log_4 64$ is

A 2

B 3

C 4

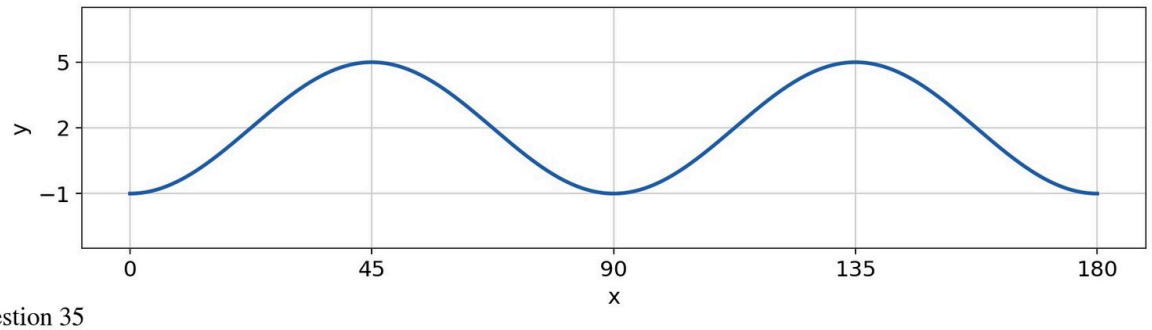
D 16

Understand It with Pulse

Flag a mistake

35

The graph below shows a sinusoidal function. The amplitude of the function is



Question 35

The graph below shows a sinusoidal function. The amplitude of the function is

A) −3

B) 3

C) 4

D) 2

A -3

B 3

C 4

D 2

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Flag a mistake

36 **A set contains 6 elements. The number of subsets of the set is**

- A 12
- B 36
- C 64
- D 720

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37 **A display case will hold 4 items chosen from 7 paintings and 5 sculptures. The number of displays that consist of exactly 2 paintings and 2 sculptures is**

- A 495
- B 210
- C 105
- D 420

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38 **A standard die is rolled twice. The probability of rolling a 5 both times is**

A $\frac{1}{6}$

B $\frac{1}{18}$

C $\frac{1}{12}$

D $\frac{1}{36}$

Understand It with Pulse | Flag a mistake

39 **The difference $\frac{x}{x-3} - \frac{2}{x}$ is equal to**

A $\frac{x^2 - 2x + 6}{x(x - 3)}$

B $\frac{x - 2}{x - 3}$

C $\frac{x^2 + 6}{x(x - 3)}$

D $\frac{x^2 - 2x + 6}{x - 3}$

Understand It with Pulse | Flag a mistake

40 **A set of data is plotted, and the points rise and then fall, changing direction once. The lowest degree of a polynomial function that models the data well is**

- **A** 2
- **B** 3
- **C** 1
- **D** 4

Understand It with Pulse | Flag a mistake

41 **The solution to the equation $2^{3x} = 64$ is**

- **A** $x = 3$
- **B** $x = 4$
- **C** $x = 2$
- **D** $x = 8$

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42 **The height of a seat on a rotating swing ride, in metres, is modelled by h(t) = -8cos(36t) + 9.5, where t is in seconds. The height of the seat after 5 seconds, to the nearest tenth, is _____ Record your answer to the nearest tenth.**

ANSWER _____

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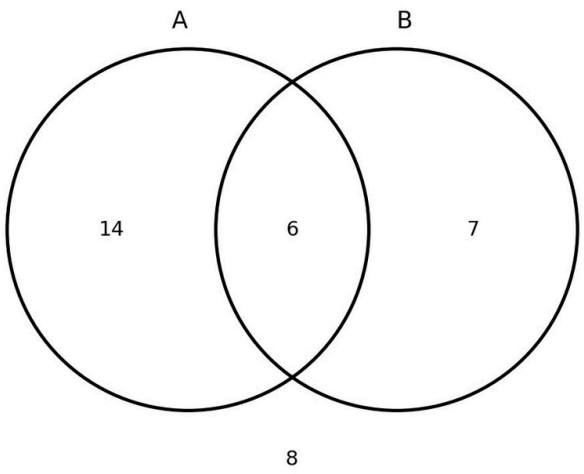
43 **The Venn diagram below shows set A for soccer players and set B for hockey players. The number of students who play neither sport is _____ Record your answer as a whole number.**



Question 43

The Venn diagram below shows set *A* for soccer players and set *B* for hockey players. The number of students who play neither sport is ____ Record your answer as a whole number.

ANSWER _____

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44 From 12 runners, a relay team of 4 runners is chosen and assigned running positions. The fastest of the 12 runners must be on the team and must run the last leg. The number of different teams with running orders is

- **A** 990
- **B** 11880
- **C** 1320
- **D** 220

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45 Of the 200 members of a gym, 80 swim and 50 both swim and lift weights. Given that a randomly chosen member swims, the probability that the member lifts weights is

- **A** $\frac{2}{5}$
- **B** $\frac{5}{8}$
- **C** $\frac{5}{13}$
- **D** $\frac{1}{4}$

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46 The solution to the equation $\frac{2x + 1}{x - 3} = 3$ is

A -10

B 4

C 10

D $\frac{10}{3}$

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47 Which statement is true about the function f(x) = x³ - 8?

Question 47

Which statement is true about the function $f(x) = x^3 - 8$?

A) Its x –intercept is 2.

B) Its y –intercept is 8.

C) It is a quadratic function.

D) Its graph falls to the right.

- **A** Its x-intercept is 2.
- **B** Its y-intercept is 8.
- **C** It is a quadratic function.
- **D** Its graph falls to the right.

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48 **An investment of $3000 earns 8% interest, compounded quarterly. The value of the investment after 1 year is**

A $3247.30

B $3240.00

C $3264.00

D $3200.00

Understand It with Pulse | Flag a mistake

49

The graph of y = asin(b(x - c)) + d has a period of 240° and a phase shift of 30° to the right. The values of b and c are

Question 49

The graph of $y = a\sin(b(x - c)) + d$ has a period of 240° and a phase shift of 30° to the right. The values of b and c are

A) $b = 240\ c = 30^\circ$

B) $b = 1.5\ c = -30^\circ$

C) $b = 2.4\ c = 30^\circ$

D) $b = 1.5\ c = 30^\circ$

A b = 240 c = 30°

B b = 1.5 c = -30°

C b = 2.4 c = 30°

D b = 1.5 c = 30°

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Flag a mistake

50 Which of the following arguments is valid?

Question 50

Which of the following arguments is valid?

A) All squares are rectangles. This figure is a rectangle, so it must be a square

B) If it rains, the picnic is cancelled. The picnic is cancelled, so it must have rained

C) All fish live in water. A salmon lives in water, so a salmon must be a fish

D) If a number ends in 0, then it is divisible by 2. The number 40 ends in 0, so 40 is divisible by 2

A All squares are rectangles. This figure is a rectangle, so it must be a square

B If it rains, the picnic is cancelled. The picnic is cancelled, so it must have rained

C All fish live in water. A salmon lives in water, so a salmon must be a fish

D If a number ends in 0, then it is divisible by 2. The number 40 ends in 0, so 40 is divisible by 2

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ANSWER KEY

1. D
2. D
3. C
4. C
5. A
6. C
7. D
8. D
9. D
10. A
11. B
12. A
13. 80
14. 8
15. 48
16. C
17. A
18. B
19. D
20. B
21. D
22. C
23. A
24. A
25. B
26. D
27. C
28. D
29. B
30. B
31. B
32. B
33. C
34. B
35. B
36. C
37. B
38. D
39. A
40. A
41. C
42. 17.5
43. 8
44. A
45. B
46. C
47. A
48. A
49. D
50. D

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