

7 HARD Problems for the JUN 2024 DSAT (Problem Sette #7)

Video Solutions at: <https://youtu.be/1xaTBljTdWw>

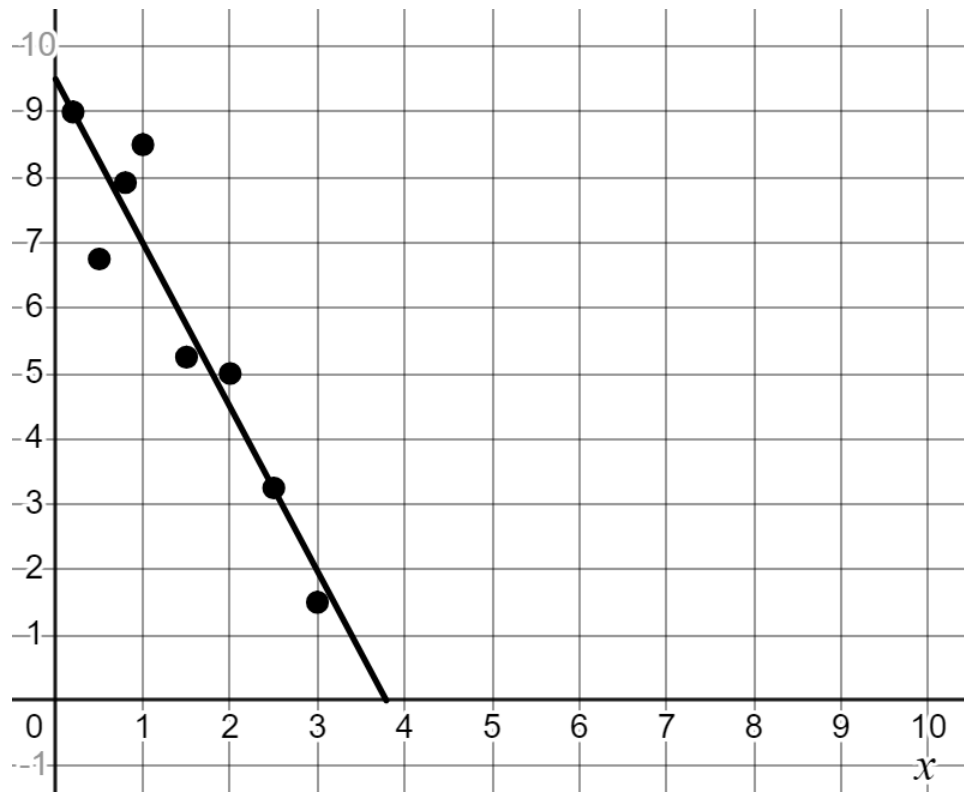
Question 1

In the xy -plane, a parabola has vertex $(-5, -12)$ and has no x -intercepts. If the equation of the parabola is written in the form $y = ax^2 + bx + c$, where a , b , and c are constants, which of the following could be the value of $a + b + c$?

- A) -19
- B) -12
- C) -10
- D) -5



Question 2



The scatterplot shows the relationship between two variables, x and y , for data set P. A line of best fit is shown. Data set Q is created by multiplying the y -coordinate of each data point from data set P by 4.3.

The equation for the line of best fit for data set Q can be written in the form $Q(x) = a + bx$. What is the value of $a - b$? Round your answer to the nearest tenth.



Question 3

$$(3x - a)^2 = (2x + j)(jx - k)$$

The given equation has infinitely many solutions, where a , j , and k are constants.
What is the value of a ?

Question 4

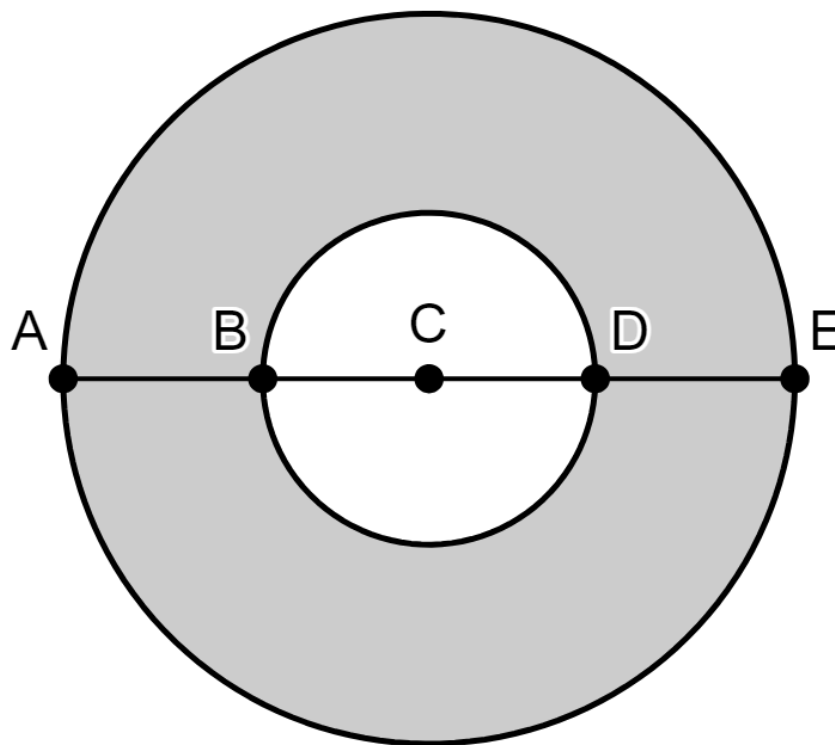
$$f(x) = -a^x + b$$

The function f is defined by the equation above, where a and b are constants. The graph of $g(x)$ is formed by taking the graph of $f(x)$ and translating it both 6 units in the negative x direction and 2 units in the negative y direction. The x -coordinate of

the x -intercept for the graph of $g(x)$ is -3 and $g(-6) = \frac{61}{64}$. What is the value of a ?



Question 5



In the figure shown, point C is the center of both circles. The ratio of AB to CD is 6 to 5. If the area of the large circle is 242, what is the area of the shaded region?



Question 6

A content creator conducted a survey and selected a random sample of 800 Nepalese SAT Math students. The selected students were asked whether they approved of the change to a digital testing format, and 496 students responded that they approved of the new digital format. Which of the following is the largest population to which the results of the study can be generalized?

- A) The 800 Nepalese SAT Math students in the sample
- B) All Nepalese students
- C) All SAT Math students
- D) All Nepalese SAT Math students



Question 7

$$a(x - 5) + 4b = 7(b - 5x)$$

The equation above has no solution where a and b are constants. The number b CANNOT be equal to the number m . What is the value of m ?