

7 HARD Problems for the MAY 2024 DSAT (Problem Sette #6)

Video Solutions at: <https://youtu.be/k9IbioW0ep0>

Question 1

$$f(x) = 5(0.92)^{3x}$$

The function f is defined by the given equation. The equation can be rewritten as

$f(x) = 5\left(1 - \frac{p}{100}\right)^x$, where p is a constant. Which of the following is closest to the value of p ?

- A) 8
- B) 12
- C) 22
- D) 24



Question 2

The concentration of a chemical compound is equal to the amount of the substance in the container, in moles, divided by the volume of the solution, in cubic centimeters. A chemist has two containers of different sizes (filled to the brim with solution!) each in the shape of a cube. The edge length of the larger container is 4 times the edge length of the smaller container. Each cube contains 144 moles of a substance. The concentration of the compound in the larger container is 3 moles per cubic centimeter. What is the positive difference between the larger container's volume and the smaller container's volume, in cubic centimeters?



Question 3

The function f is defined by $f(x) = ax^2 + bx + c$, where a , b , and c are constants. The graph of $y = f(x)$ is a parabola where $f(-11) = f(-1)$. If b is an integer less than -3 , what is the greatest possible value of $a + b$?



Question 4

An equilateral triangle is inscribed in a circle with a radius of 8 inches. What is the area of the region that lies within the circle but outside the triangle, in square inches? Round your answer to the nearest tenth.



Question 5

$$\frac{3a}{8}x = \frac{3}{2} + \frac{15}{8}y$$

$$\frac{18}{7}y - 4 = \frac{4b}{7}x - 9$$

In the given system of equations, a and b are positive constants. The system has no solution. If b is $p\%$ less than a , what is the value of p ?



Question 6

$$\frac{5x}{8} = -\frac{3y}{2} - \frac{11}{6}$$

The equation above gives the graph of a line in the xy -plane. The line is then shifted left 4 units and shifted up 5 units. What is the x -coordinate of the x -intercept of the resulting line?



Question 7

Height (inches)	Number of Male Players	Number of Female Players
65	2	7
68	5	9
70	10	12
73	10	12
76	19	11
78	8	4
81	2	1

The frequency table above gives the distribution of heights, in inches, for a random sample of 56 male basketball players and 56 female basketball players. What is the positive difference between the median height (in inches) for male players and the median height (in inches) for female players?