

7 HARD Problems for the AUG 2023 DSAT (Problem Sette #1)

Video Solutions at: <https://youtu.be/BIB2lSXO5oI>

Question 1

A regular hexagonal prism has a volume of 350 cubic inches and a height of 14 inches. What is the perimeter of each of the hexagonal bases, in inches? Round your answer to the nearest tenth of an inch.

Question 2

In the given system of equations, p and r are constants. If the system has no solution, which of the following must be true?

I) $p = \frac{19}{4}$

II) $p = -\frac{10}{3}$

III) $r = -30$

IV) $3r \neq 8$

$$\frac{5}{2}x - \frac{19}{4}y = x - 6$$

$$\frac{89}{9}y + px = 5r - \frac{2}{3}y$$

A) I and III

B) II and IV

C) III and IV

D) I and IV



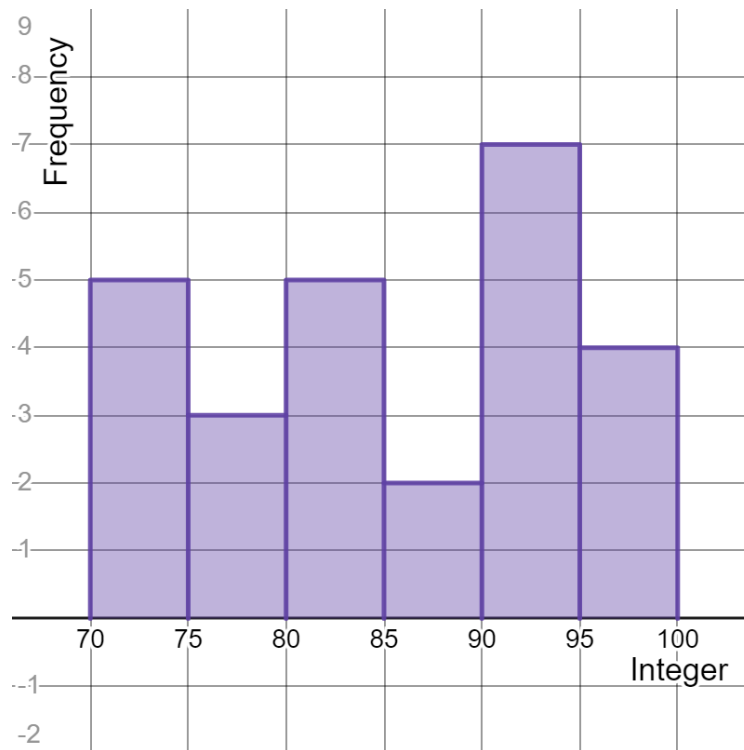
Question 3

$$\sqrt{48} \sqrt[5]{81}$$

The expression above can be rewritten in the form $a\sqrt[b]{c}$ where a , b , and c are positive integer constants. What is the smallest possible value of $a + b + c$?



Question 4



One data set of 26 integers is summarized in the histogram shown. For the histogram, the first interval represents the frequency of integers greater than or equal to 70, but less than 75. The second interval represents the frequency of integers greater than or equal to 75, but less than 80, and so on. What is the largest possible value of the median?



Question 5

$$-2x^2 + 8x - \frac{b}{a} = 0$$

In the equation above, a , b , and c are positive constants. The product of the solutions to the given equation is $\frac{5}{7}$. The number b is 64% less than the number c . The number a is $p\%$ less than the number c . What is the value of p ?

**Question 6**

A quadratic function models the height, in feet, of an object above the ground in terms of the time, in seconds, after the object is launched off an elevated surface. The model indicates the object hits the ground 16 seconds after being launched; the object reaches its maximum height of 1,296 feet above the ground 7 seconds after being launched. Based on the model, at what time after the object is launched, in seconds, does the object first reach a height of 972 feet?



Question 7

A 30-60-90 triangle has a perimeter of $18 + 6\sqrt{3}$ inches. What is the triangle's area, in square inches? Round your answer to the nearest hundredth of a square inch.