

Question 1

Evaluate:

$$\frac{10 - 4^2(5 - 4.5)}{26 - 3 \cdot 2^3} + [16 - (100 - 9^2)] \cdot 2^{3^3 - 5^2}$$

Question 2

The formula $F = \frac{9}{5}C + 32$ is used to convert Celsius temperatures into Fahrenheit. Convert these four temperatures into Fahrenheit and then find the average of the Fahrenheit temperatures:

$$-20^\circ \text{ C}$$

$$0^\circ \text{ C}$$

$$20^\circ \text{ C}$$

$$60^\circ \text{ C}$$

Question 3

One hundred cards numbered 1 through 100 are put into a box and shaken up. A card is then drawn at random. What is the probability that the number on the card will be a prime number? If you answer with a fraction, please make sure to reduce it.

Question 4

Solve the following quadratic equations. Each one has a hint as to how to solve it most efficiently.

$$10x^2 - 45 - 15x = 0 \text{ (FACTOR)}$$

$$(x - 3)^2 = 16 \text{ (SQUARE ROOT PROPERTY)}$$

$$x^2 + 14x = -39 \text{ (COMPLETE THE SQUARE)}$$

$$9x^2 - 6x - 2 = 0 \text{ (QUADRATIC FORMULA)}$$

Of the eight different solutions that your team found, what is the sum of the largest plus the smallest of these solutions?

Question 5

$N!$ means $N \cdot (N-1) \cdot (N-2) \cdot (N-3) \cdot \dots \cdot 1$

For example, $5!$ is $5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 120$

Evaluate: $\frac{(5!)(7!)(9!)}{(6!)(8!)}$

Question 6

Find the mean, median and mode from the following frequency diagram and then add the three results together:

Number	Frequency
30	1
31	2
33	1
34	1
35	2
37	1
38	3
40	1

Question 7

The number 2,467,125,75a,426,628,902 is divisible by 9 if and only if a is what?

Question 8

Solve for x :

$$3x - 5xy^2 = -2x - 7y$$

Question 9

A rectangular swimming pool has a length of $10x$ meters and a width of $6x$ meters. If a rectangular walkway 2 meters wide surrounds the pool, find an expression for the amount of fencing (in meters) that would be needed to go around the outside of the walkway. Make sure to simplify your expression.

Question 10

Solve for x : $|6 - 2x| - 7 = 13$

Question 11

Find the equation in standard form (the x term must be positive) of the line that passes through the point $(-1, 2)$ and is perpendicular to the line $y = -2x - 3$

Question 12

How many of the following statements are true?

$$-9 + 5 + 6 = -2$$

$$-6 + (8 - 5) = -3$$

$$|-8 + 3| = 8 + 3$$

$$(-2) + (-3) + (-6) = 12 + (-1)$$

$$-2 + |-5| + 3 = 8 + (-2)$$

$$-3 + (-5 - 8) - (-6 + 2) = -12$$

Question 13

The slope of a horizontal line times the product of the slopes of two perpendicular lines (neither of which is horizontal) times the slope of the line with the equation $y=-x$ times the slope of the line with the equation $y=2x$ is what?

Question 14

What is the 50th digit to the right of the decimal point in the decimal representation of $\frac{1}{7}$?