QUESTION 1

Let

$$\begin{aligned} A &= \text{The number of sides in an } n-\text{gon} \\ B &= \text{The value for } x \text{ that satisfies: } 2n - x = n. \\ C &= \text{The number of inches in 3 feet.} \\ D &= \text{The area of a rectangle with length 4 and width 1.5.} \end{aligned}$$

Compute the value of $\dfrac{AC}{BD}$.

QUESTION 2

There are 30 marbles are in a bag: 10 blue marbles, 15 green marbles, and 5 red marbles. One marble is drawn. Let

$$\begin{aligned} A &= \text{the probability of drawing a red marble.} \\ B &= \text{the probability of drawing a blue marble.} \\ C &= \text{the probability of drawing a green marble.} \\ D &= \text{the probability of drawing a purple marble.} \end{aligned}$$

Compute the value of $ABCD$.

QUESTION 3

The scores for Mrs. Funk's pre-calculus test are 49, 52, 56, 63, 69, 71, 71, and 100. Let

$$\begin{aligned} A &= \text{the median of the set of scores.} \\ B &= \text{the mode of the set of scores.} \\ C &= \text{the mean of the set of scores, rounded to two decimal places.} \\ D &= \text{the range of the set of scores.} \end{aligned}$$

Compute the value of $(A + B) - (C + D)$.

QUESTION 4

Let

$$\begin{aligned} A &= \frac{8}{13}, \text{ rounded to 3 decimal places.} \\ B &= \frac{2}{3}, \text{ rounded to 3 decimal places.} \\ C &= \frac{1}{2}, \text{ rounded to 3 decimal places.} \\ D &= \frac{3}{8}, \text{ rounded to 3 decimal places.} \end{aligned}$$

Find $A + B + C + D$ in decimal form, rounded to 3 decimal places.

QUESTION 5

Let

$$\begin{aligned} A &= w, \text{ where } w + 5 = 13. \\ B &= x, \text{ where } 3x + 7 = 5 - x. \\ C &= y, \text{ where } \frac{2x + 9}{4} = 3x. \\ D &= z, \text{ where } 3(5z - 7) = 8((z + 2) - 4). \end{aligned}$$

Compute the value of $A - 2B + 10C + 7D$.

QUESTION 6

Let $\Omega(a, b, c) = \sqrt{b^2 - 4ac}$. Then

$$\begin{aligned} A &= \Omega(4, 3, -1) \\ B &= \Omega\left[(\Omega(1, 3, 2)), (\Omega(4, 5, 1)), (\Omega(1, 6, 9))\right] \\ C &= \text{the value of } ac \text{ where } \Omega(a, 4, c) = 12. \\ D &= \text{the positive value of } b \text{ where } \Omega(5, b, 20) = 0. \end{aligned}$$

Compute the value of $A + B + C + D$.

QUESTION 7

Use the Pythagorean theorem to find the missing side of the following right triangles.

A	A right triangle with legs of length 3 and 4
B	A right triangle with a leg of length 8 and a hypotenuse of length 10
C	A right triangle with legs of length 5 and 12
D	A right triangle with a leg of length 15 and a hypotenuse of length 17

Compute the value of $\dfrac{ABC}{D}$.

QUESTION 8

Let

$$\begin{aligned} A &= \text{The smallest prime number greater than 8} \\ B &= \text{The greatest prime number less than 56} \\ C &= \text{The smallest prime number greater than 20} \\ D &= \text{The only even prime number} \end{aligned}$$

Compute the value of $A + B + C + D$.

QUESTION 9

Let

$$\begin{aligned} A &= 0.\overline{3} \\ B &= 0.\overline{45} \\ C &= 0.3\overline{72} \\ D &= 1.\overline{09} \end{aligned}$$

Compute the value of $A + B + 10C + D$ and express your answer as a common fraction in simplest form.

QUESTION 10

Given that $x = 4$ and $y = -2$,

Let

$$\begin{aligned} A &= 3x - 4y \\ B &= -3x - 4y \\ C &= \frac{x}{3} - \frac{y}{4} \\ D &= 3xy \end{aligned}$$

Compute the value of $(A + B) - (CD)$.

QUESTION 11

Let

A = the smallest integer that is divisible by the first three positive composite integers.
B = the number of positive factors of 24.
C = the least common multiple of 42 and 24.
D = the probability of rolling a 1 on a standard fair die.

Find $\frac{C}{ABD}$.

QUESTION 12

Let

$$\begin{aligned} A &= \text{the value of } a \text{ such that } \frac{3}{8} = \frac{15}{a}. \\ B &= \text{the value of } v \text{ such that } \frac{3}{2} = \frac{v}{10}. \\ C &= \text{the value of } x \text{ such that } \frac{x}{240} = \frac{2.1}{2.4}. \\ D &= \text{the value of } s \text{ such that } \frac{s-3}{5} = 35. \end{aligned}$$

Compute the value of $A + B + C + D$.

QUESTION 13

Find the slope of each line.

$$\begin{aligned} A &= \text{the slope of the line } 5x + 3y = 15 \\ B &= \text{the slope of the line } 10 - x = 2y \\ C &= \text{the slope of the line } 4x = 8y - 12 \\ D &= \text{the slope of the line } \frac{5}{6}x + \frac{1}{15}y = \frac{3}{10} \end{aligned}$$

Find $\dfrac{AB - C}{D}$.

QUESTION 14

Let

$$\begin{aligned} A &= \text{the number of distinct ways to place 4 people in a line.} \\ B &= \text{the number of ways to arrange 4 people in a circle.} \\ C &= \text{the solution to the equation } 2x + 5 = 7. \\ D &= \text{the number of ways to choose 3 balls from a group of 6 distinguishable balls.} \end{aligned}$$

Compute the value of $A + B + C + D$.