

Question 1

$A =$ the positive root of $15x^2 = 7x + 4$

$B =$ the sum of the 2 roots of $\left| \frac{2x-7}{4} \right| = 3$

What is $10A - B$?

Question 2

Find $\frac{ab}{c}$ if

$$4 = \begin{vmatrix} a & -2 \\ 5 & 2 \end{vmatrix}$$

$$\frac{4}{b+2} - \frac{7}{b+3} = 0$$

$$c^4 = (-2)^{-12}$$

Question 3

For this problem, $i = \sqrt{-1}$

$A =$ the simplified form of $\frac{3+2i}{4-i}$

$B =$ the simplified form of $i^{24} \bullet i^{48} \bullet i^{73} \bullet i^{1009}$

Find $A + B$ in the simplified form $a + bi$

Question 4

Given $f(x) = 3x + 9$, $g(x) = x^2 + 4x - 5$, $h(x) = \frac{x-3}{x+5}$

$$A = f^{-1}(g(1))$$

$$B = h(f^{-1}(6))$$

Find A^B

Question 5

$$A = 27^{-\frac{2}{3}} \text{ (27 to the negative } \frac{2}{3} \text{ power)}$$

$$B = \text{ the slope of } f^{-1}(x) \text{ where } f(x) = \frac{7+x}{5}$$

$C =$ the remainder when $2x^3 - 4x^2 - 7x - 6$ is divided by $(x-4)$

$$\text{Find } \frac{B}{A} - C$$

Question 6

Find a so that $x-4$ shall be a factor of

$$4x^3 + 2(a-5)x^2 + (a-4)x + 4a$$

Question 7

Find the value of $x + y + z$

$$9^{(y-2)} = \left(\frac{1}{3}\right)^{(y+1)}$$

$$32^{\frac{z}{10}} = 8$$

$$125^{\frac{1}{4}} = 25^{\frac{3}{x}}$$

Question 8

Give the equation of the line, in $Ax + By + C = 0$ form, which passes through the center of the circle

$$x^2 - 8x + y^2 + 4y - 80 = 0 \text{ and is parallel to}$$

$$4x - y = 24$$

Question 9

A = the radius of the circle $x^2 + y^2 - 6x + 10y + 9 = 0$

B = the number of integral solutions of $x^2 < x + 12$

C = the solution of $3\sqrt{x} = x - 10$

Find $(AB - C)^2$

Question 10

Find $x + y$ if $2^{3x-y} = 32$ and $0.0625^{x-y} = 64$

Question 11

Solve for k . $\frac{7}{3} = \frac{1-k^{-2}}{1+k^{-1}}$

Question 12

A = the distance from P to $(9, -1)$ where P lies on the line $y = \frac{4}{3}x - 5$ and has a y-coordinate of 3.

B = the value of k when the lines $\frac{2}{3}x - \frac{2}{5}y = 8$
 $\frac{1}{4}x + ky = 9$

Find $\frac{A}{B}$

Question 13

Sarah can clean the house in 2 hours while Eddie can clean it in 3 hours. Let A = the number of hours it will take them to clean the house if they work together.

A ball is dropped from 30 feet. If it rebounds after the first bounce to $\frac{5}{6}$ of its original height (30 feet) and on the second bounce to $\frac{5}{6}$ of the previous bounce and so on. Let B = the bounce in which the ball is first below 7 feet.

Find $5A+B$

Question 14

Given that $\frac{1}{1+\frac{1}{1+x}} = \frac{1}{2}$ find the value of $3+\frac{x}{3}$