

### Question 1

List the vertices of the quadrilateral created by the following inequalities:

$$y - 2x \leq 4$$

$$2y \leq -3x + 29$$

$$2y \geq 3x - 13$$

$$5y \geq -3x + 20$$

### Question 2

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

A = the simplified form of  $\frac{5+4i}{2-2i}$

B = the simplified form of  $i^{405} \cdot i^{390} \cdot i^{47} \cdot i^{803}$

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

### Question 3

Give the equation of the line, in  $ax + by = c$  form, which passes through the center of the circle  $x^2 + y^2 - 14x + 10y + 73 = 0$  and is perpendicular to  $x + 2y = 5$

### Question 4

A = the value of  $\frac{f(1) - f(0)}{f(2)}$  when  $f(x) = \frac{3x^2 - 2x + 1}{2x - 3}$

B = the value of  $n$  for  $\log_3 3^{2n-3} + \log_3 \frac{1}{27} = \log_5 625$

Find the value of  $\sqrt[3]{\frac{A}{B}}$

Question 5

Find  $a$  so that  $y + 2$  shall be a factor of

$$3y^3 + 2(a - 3)y^2 + (a + 5)y + 2a$$

Question 6

A = the negative root of  $x^2 = 4x + 1$

B = the sum of the two solutions of  $\left| \frac{2x - 3}{4} \right| = 5$

Find the exact value of AB

Question 7

$$A = 16^{\frac{-3}{4}}$$

B = the constant of  $f^{-1}(x)$  when  $f(x) = \frac{x+3}{5}$

C = the remainder when  $x^3 + 8x^2 + 5x + 6$  is divided by  $x + 7$

Find  $\frac{C}{A} + B$

Question 8

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

Question 9

George and Gracie solved  $x^2 + px + q = 0$ , but George was careless and used the wrong value for  $p$ . He got -2 and 39 as the values of  $x$ . Gracie used the wrong value of  $q$  and got solutions of -4 and 11. What are the actual roots?

Question 10

Find the value of  $x + y + z$  when

$$27^{(y-1)} = 9^{2y}$$

$$16^{\frac{x}{2}} = 8^{x-1}$$

$$\left(\frac{1}{2}\right)^{\frac{-1}{z}} = 4^{\frac{2}{3}}$$

Question 11

If  $f(x) = 3x$  and  $g(x) = \left(\frac{2x}{1-x}\right)$ , find  $g(f(x))$

Question 12

Find the solution set for  $\frac{2}{x-3} > \frac{1}{x-1}$ . Give answer in interval notation.

Question 13

Find  $A + B + C$  if

A = the positive value of  $x$  for  $(x^{-1+\sqrt{2}})(x^{-1-\sqrt{2}}) = 9$

B = the value of  $x$  for  $\frac{2x}{3} + 3 = \frac{x}{3}$

C = the value of  $\frac{x}{y}$  if  $3x - 2y = 0$

Question 14

A = the distance from P to (-1,1) where point P lies on the line

$y = \frac{2}{3}x + 1$  and has x-coordinate 6

B = the value of  $c$  when the lines  $\frac{2}{3}x - \frac{2}{5}y = 6$  and  $\frac{1}{2}x + cy = 9$

are perpendicular

Find  $\frac{A^2}{B}$