

NAME

EMAN SAEED

SUBMITTED BY

16986

SUBMITTED TO

DR. LIAQAT ALI

SUBJECT

BUSINESS MATHEMATIC

TECHNOLOGY

BBA

SEMESTER

1ST

BUSINESS MATHEMATICS :

Question no. 1.

1- e.

2- b.

3- d.

4- e.

5- d.

6- e.

7- e.

8- e.

9- a.

10- e.

Question no. 2 (a).

Find the domain and range of the function $f \circ g(x)$ where $f \circ g(x) = f(g(x))$.

$$f(x) = \sqrt{x^2 - 1} \text{ and } g(x) = x + 1.$$

Sol:-

$$f(g(x)) = f(x+1) \quad \because g(x) = x+1.$$

$$f(g(x)) = \sqrt{(x+1)^2 - 1}.$$

$$f(g(x)) = \sqrt{x^2 + 2x + 1 - 1}.$$



$$f(g(x)) = \sqrt{x^2 + 2x}.$$

It is defined if $(x^2 + 2x) \geq 0$.

$$x(x+2) \geq 0.$$

where $x \geq 0$ and $(x+2) \geq 0$.
 $\Rightarrow x \geq -2$.

Domain :

All real numbers.

$$(-\infty, \infty).$$

$$(x \geq 0) \text{ or } (x \geq -2).$$

Range :

$$(-\infty, \infty).$$

$$\{R\}.$$

Question no. 2 (b).

Solve the following $|3x-3| = 4x-2$.

Sol :-

$$(3x-3) = +(4x-2).$$

$$3x - 4x = -2 + 3.$$



$$-x = 1 \quad (\div \text{ by } -1 \text{ on both sides}).$$

$$x = -1.$$

Now.

$$(3x-3) = -(4x-2).$$

$$3x-3 = -4x+2.$$

$$3x+4x = +3+2.$$

$$7x = 5.$$

$$x = \frac{5}{7}.$$

Answer :

$$x = -1, \frac{5}{7}.$$

Question no. 3 (a).

Find the inverse of the following.

$$\begin{bmatrix} -5 & -6 \\ -0 & -7 \end{bmatrix}.$$

Sol:-

$$\text{Adj of } A = \begin{bmatrix} -7 & +6 \\ 0 & -5 \end{bmatrix}$$



$$|A| = \begin{vmatrix} -5 & -6 \\ 0 & -7 \end{vmatrix} .$$

$$= (-5 \times -7) - (-6 \times 0) .$$

$$|A| = -35 .$$

$$A^{-1} = \frac{\text{Adj. } A}{|A|} .$$

$$= \frac{\begin{vmatrix} -7 & 6 \\ 0 & -5 \end{vmatrix}}{-35} .$$

$$= \begin{vmatrix} -7/-35 & 6/-35 \\ 0/-35 & -5/-35 \end{vmatrix} .$$

$$A^{-1} = \begin{vmatrix} 1/5 & -6/35 \\ 0 & 1/7 \end{vmatrix}$$

Ans .



Question no. 3 (b).

Solve the following

$$x + 2y = 2 \quad \text{--- (1)}$$

$$3x - 5y = 3 \quad \text{--- (2)}$$

Sol:

to find y ,

multiply 3 in equation 1.

$$3x + 6y = 6$$

$$\oplus \quad 3x \ominus 5y = \oplus 3$$

$$\begin{array}{r} - \quad \quad \quad + \quad \quad \quad - \\ \hline \quad \quad \quad 11y = 3 \end{array}$$

$$\Rightarrow 11y = 3$$

$$\Rightarrow y = \frac{3}{11}$$

to find x ,

$$x + 2y = 2$$

$$x + 2\left(\frac{3}{11}\right) = 2$$



$$x + \frac{6}{11} = 2$$

$$x = 2 - \frac{6}{11}$$

$$x = \frac{22 - 6}{11}$$

$$x = \frac{16}{11}$$

$$S.S = \left\{ \frac{16}{11}, \frac{3}{11} \right\}$$

Question no. 4 (a).

At what point the function is undefined.

$$f(x) = \frac{x-1}{x^2-9x+20}$$

Sol.:

To make function undefined denominator should be zero.

$$x^2 - 9x + 20 = 0$$

$$x^2 - 4x - 5x + 20 = 0$$



$$x(x-4) - 5(x-4) = 0.$$

$$(x-5)(x-4) = 0.$$

$$x-5 = 0 \quad , \quad x-4 = 0.$$

$$x = 5 \quad , \quad x = 4.$$

So $f(x) = 5$ and $f(x) = 4$.

The points where the function is undefined are $= (4, 5)$.

Question no. 4 (b).

The sum of the ages of a girl and her brother is 26 years. Three years ago her age was four times the age of her brother. Find the present age of the girl and her brother.

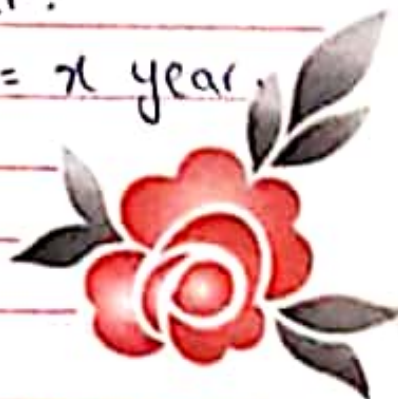
Sol:

Let,

Present age of girl = y year.

Present age of her brother = x year.

Then according to condition we have,



$$x + y = 26 \text{ --- ①}$$

$$4(x - 3) = y - 3.$$

$$4x - 12 = y - 3.$$

$$4x - y = -3 + 12.$$

$$4x - y = 9 \text{ --- ②}$$

$$x + y = 26$$

$$5x = 35$$

$$\frac{5x}{5} = \frac{35}{5}.$$

$$x = 7.$$

Now to find value of y ,

$$x + y = 26.$$

$$7 + y = 26.$$

$$y = 26 - 7.$$

$$y = 19.$$

So the current age of girl is 19 and her brother is 7.

Question no. 5 (a).

Find the factor of all orders of $x^4 - 16$ and $x^2 - 6x + 9$.

Sol:

1- $x^2 - 6x + 9$.

$$x^2 - 3x - 3x + 9$$

$$x(x-3) - 3(x-3)$$

$$(x-3)(x-3)$$

$$(x-3)^2 \text{ Ans.}$$

2- $x^4 - 16$.

$$\because a^2 - b^2 = (a+b)(a-b)$$

$$(x^2)^2 - (4)^2$$

$$(x^2 + 4)(x^2 - 4) \Rightarrow (x^2 + 4)(x^2 - 2^2)$$

$$(x^2 + 4)(x+2)(x-2)$$

Question no. 5 (b).

The manager of Roseville Appliance bought a coffee maker manufactured in Spain for \$15 and will sell it for \$18.75. Find percent of markup based on cost.

Sol:-

$$\text{Markup price} = \text{selling price} - \text{cost price}$$

$$\begin{aligned}\text{Markup Price} &= 18.75 - 15 \\ &= 3.75 \$\end{aligned}$$

Now to find Percentage markup in cost.

$$\Rightarrow \frac{3.75}{15} \times 100.$$

$$\Rightarrow 0.25 \times 100.$$

$$\Rightarrow \% \text{ age} = 25 \%.$$

The percentage of markup based on cost = **25 %**.