No.

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IX Test-5 (Submit in GC+Construction)

1) Given an example of two irrational numbers whose difference is a rational number. avoid eg:- like $\sqrt{2}-\sqrt{2}=0$

2) Find an irrational number between 0.5 and 0.55

3) Simplify : $\sqrt{50} + \sqrt{162} - \sqrt{98}$

4) If $a = 2$ and $b = 3$, find the value of (i) $(a^b + b^a)^{-1}$ ~~and~~

(ii) $(a^a + b^b)^{-1}$

$(\overset{R}{a} + \overset{IR}{b}) - (\overset{R}{c} + \overset{IR}{d})$

5) Find the value of $(1^3 + 2^3 + 3^3)^{-\frac{3}{2}}$

6) Show that $\left(\dfrac{x^a}{x^b}\right)^{a+b} \cdot \left(\dfrac{x^b}{x^c}\right)^{b+c} \cdot \left(\dfrac{x^c}{x^a}\right)^{c+a} = 1$

7) If $a = 2+\sqrt{5}$ and $b = \frac{1}{a}$, find $a^2 + b^2$

8) If $f(x) = 3x+5$, evaluate $f(7) - f(5)$

9) Factorise : $6 - x - x^2$

$3x^4 + 0x^3 + 2x^2 + 0x - 3$

10) Divide $3x^4 + 2x^2 - 3$ by $x+1$ and find quotient and remainder.

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IX Test - 5 (Answers)

1) $(5+\sqrt{3})-(3+\sqrt{3}) = 5+\cancel{\sqrt{3}}-3-\cancel{\sqrt{3}} = 5-3 = 2$, rational number

2) $0.5252252225\ldots$

3) $5\sqrt{2}+9\sqrt{2}-7\sqrt{2}$

$= 14\sqrt{2}-7\sqrt{2}$

$= \underline{\underline{7\sqrt{2}}}$

$$\begin{array}{r|l} 5 & 50 \\ 5 & 10 \\ & 2 \end{array} \qquad \begin{array}{r|l} 2 & 162 \\ 3 & 81 \\ 3 & 27 \\ 3 & 9 \\ & 3 \end{array} \qquad \begin{array}{r|l} 2 & 98 \\ 7 & 49 \\ & 7 \end{array}$$

4) (i) $(a^b+b^a)^{-1} = (2^3+3^2)^{-1}$

$= (8+9)^{-1} = (17)^{-1} = \underline{\underline{\frac{1}{17}}}$

(ii) $(a^a+b^b)^{-1} = (2^2+3^3)^{-1}$

$= (4+27)^{-1} = (31)^{-1} = \underline{\underline{\frac{1}{31}}}$

5) $(1^3+2^3+3^3)^{-\frac{3}{2}} = (1+8+27)^{-\frac{3}{2}}$

$= (36)^{-\frac{3}{2}} = 6^{\cancel{2}\times -\frac{3}{\cancel{2}}} = 6^{-3} = \frac{1}{6^3} = \underline{\underline{\frac{1}{216}}}$

6) $(x^{a-b})^{a+b} \cdot (x^{b-c})^{b+c} \cdot (x^{c-a})^{c+a}$

$= x^{a^2-b^2} \cdot x^{b^2-c^2} \cdot x^{c^2-a^2}$

$= x^{\cancel{a^2}-\cancel{b^2}+\cancel{b^2}-\cancel{c^2}+\cancel{c^2}-\cancel{a^2}} = x^0 = \underline{\underline{1}}$

7) $a = 2+\sqrt{5}$

$b = \frac{1}{a} = \frac{1}{2+\sqrt{5}} = \frac{2-\sqrt{5}}{(2+\sqrt{5})(2-\sqrt{5})} = \frac{2-\sqrt{5}}{4-5} = \frac{2-\sqrt{5}}{-1} = \sqrt{5}-2$

$a^2 = (2+\sqrt{5})^2 = 4+5+4\sqrt{5} = 9+4\sqrt{5}$

$b^2 = (\sqrt{5}-2)^2 = 5+4-4\sqrt{5} = 9-4\sqrt{5}$

$\therefore a^2+b^2 = 9+\cancel{4\sqrt{5}}+9-\cancel{4\sqrt{5}} = \underline{18}$

8) $f(x) = 3x + 5$

$f(7) = 3 \times 7 + 5 = 21 + 5 = 26$

$f(5) = 3 \times 5 + 5 = 15 + 5 = 20$

$\therefore f(7) - f(5) = 26 - 20 = \underline{\underline{6}}$

9) $6 - x - x^2 = -x^2 - x + 6$

$= -x^2 - 3x + 2x + 6$

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

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

$= \underline{\underline{(2-x)(x+3)}}$

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-1 -6

$-3, 2$

10) On dividing $3x^4 + 0x^3 + 2x^2 + 0x - 3$ by $x+1$,

$$
\begin{array}{r|l}
 & 3x^3 - 3x^2 + 5x - 5 \\
\hline
x+1 & 3x^4 + 0x^3 + 2x^2 + 0x - 3 \\
 & \overset{(-)}{}3x^4 \overset{(-)}{+} 3x^3 \\
\hline
 & -3x^3 + 2x^2 + 0x - 3 \\
 & \overset{(+)}{-}3x^3 \overset{(+)}{-} 3x^2 \\
\hline
 & 5x^2 + 0x - 3 \\
 & \overset{(-)}{}5x^2 \overset{(-)}{+} 5x \\
\hline
 & -5x - 3 \\
 & \overset{(+)}{-}5x \overset{(+)}{-} 5 \\
\hline
 & \underline{\underline{2}}
\end{array}
$$

quotient $= 3x^3 - 3x^2 + 5x - 5$

remainder $= 2$