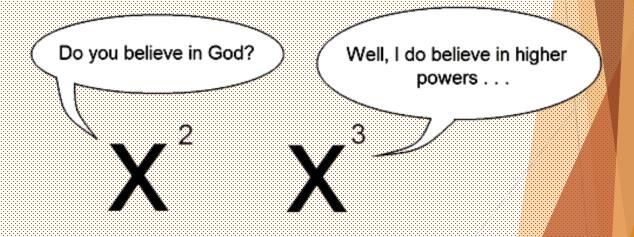


Question-Answer series

Quadratic Equations

(50 solved problems + 10 practice problems)



CONTENTS

1. Quadratic Equations

Pg-1-47

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Dear students, I hope you will find the solved problems helpful while preparing for the Quadratic Equations chapter. Please let me know if you find any error. Suggestions are always welcome.

Quadratic Equations

i)
$$\frac{x-2}{x+2} + \frac{x+2}{x-2} = 4$$

ii)
$$\frac{1}{\chi+1} - \frac{2}{\chi+2} = \frac{3}{\chi+3} - \frac{4}{\chi+4}$$

$$(x)$$
 $\chi^{2/3} - \chi^{4/3} - 2 = 0$

Answers

i)
$$\frac{\chi-2}{\chi+2} + \frac{\chi+2}{\chi-2} = 4$$

$$\Rightarrow \frac{(\chi-2)^2+(\chi+2)^2}{(\chi+2)(\chi-2)} = 4$$

$$\Rightarrow (\chi-2)^2 + (\chi+2)^2 = 4(\chi+2)(\chi-2)$$

$$\Rightarrow \chi^2 + 4 - 4\chi + \chi^2 + 4 + 4\chi = 4(\chi^2 - 2\chi + 2\chi - 4)$$

$$\Rightarrow 2x^2 + 8 = 4x^2 - 16$$

$$= \chi^2 - 12 = 0$$

$$\Rightarrow \chi^2 = 12$$

$$\Rightarrow \chi = \pm \sqrt{12} = \pm 2\sqrt{3}$$

$$\Rightarrow \frac{1}{\chi+1} + \frac{4}{\chi+4} = \frac{3}{\chi+3} + \frac{2}{\chi+2}$$

ii) $\frac{1}{\chi + 1} - \frac{2}{\chi + 2} = \frac{3}{\chi + 3} - \frac{4}{\chi + 4}$

$$= \frac{(\chi+4)+4(\chi+1)}{(\chi+1)(\chi+4)} = \frac{3(\chi+2)+2(\chi+3)}{(\chi+3)(\chi+2)}$$

$$\Rightarrow \frac{5x+8}{x^2+5x+4} = \frac{5x+12}{x^2+5x+6}$$

$$\Rightarrow$$
 (5x+8) (x2+5x+6) = (5x+12)(x2+5x+6)

$$\Rightarrow 5x^3 + 25x^2 + 30x + 8x^2 + 40x + 48 = 5x^3 + 25x^2 + 20x + 12x^2 + 60x + 48$$

$$\Rightarrow 10\pi = 4x^2 + 20\pi$$

$$9 \quad 4x^2 + 10x = 0$$

iii)
$$2^{x+1}+4^x=8$$

$$a. 2^x. 2+2^{2x}=8$$

Put, y=2x

on
$$y(y+4)-2(y+4)=0$$
 a, $(y+4)(y-2)=0$
or, $y \neq -4$. $y=2$.
Put, $y=2$ in $y=2^{x}$,
 $2=2^{x}$ or $2^{x}=2^{1}$

iv)
$$\chi^{2/3} - \chi^{2/3} - 2 = 0$$

Let, $y = \chi^{2/3}$
Then, $y^2 - y - 2 = 0$.

$$\Rightarrow y^{2} - 2y + y - 2 = 0$$

$$\Rightarrow y(y-2) + (y-2) = 0$$

$$\Rightarrow (y-2)(y+1) = 0$$

If
$$y=2$$
 Then, $x^{2/3}=2$ $x=8$

If
$$y=-1$$
 Then, $x^{2/3}=-1$
 $x=-1$.

i)
$$(x^2+3x+2)^2-8(x^2+3x)-4=0$$

iii)
$$\chi(\chi+2)(\chi^2-1)=-1$$

