Polynomials Ex 2.1 Q3

**Answer :**

Since $\alpha$ and $\beta$ are the zeros of the quadratics polynomial $f(x)=6x^2+x-2$

sum of zeros = $\dfrac{-\text{Coefficient of } x}{\text{Coefficient of } x^2}$

$$\alpha+\beta=-\frac{1}{6}$$

Product of the zeros = $\dfrac{\text{Constant term}}{\text{Coefficient of } x^2}$

$$\alpha\beta=\frac{-2}{6}$$

$$\alpha\beta=-\frac{1}{3}$$

We have, $\dfrac{\alpha+\beta}{\beta+\alpha}$

$$\frac{\alpha+\beta}{\beta+\alpha}=\frac{\alpha^2+\beta^2}{\alpha\beta}$$

$$\frac{\alpha+\beta}{\beta+\alpha}=\frac{(\alpha+\beta)^2-2\alpha\beta}{\alpha\beta}$$

By substituting $\alpha+\beta=\frac{-1}{6}$ and $\alpha\beta=-\frac{1}{3}$ we get ,

$$\frac{\alpha+\beta}{\beta+\alpha}=\frac{\left(-\frac{1}{6}\right)^2-2\left(-\frac{1}{3}\right)}{-\frac{1}{3}}$$

$$\frac{\alpha+\beta}{\beta+\alpha}=\frac{\frac{1}{36}+\frac{2}{3}}{\frac{-1}{3}}$$

$$\frac{\alpha+\beta}{\beta+\alpha}=\frac{\frac{1}{36}+\frac{24}{36}}{\frac{-1}{3}}$$

$$\frac{\alpha+\beta}{\beta+\alpha}=\frac{\frac{25}{36}}{-\frac{1}{3}}$$

$$\frac{\alpha+\beta}{\beta+\alpha}=\frac{25}{\cancel{36}_{12}}\times\frac{\cancel{3}}{-1}$$

$$\frac{\alpha+\beta}{\beta+\alpha}=\frac{-25}{12}$$

Hence, the value of $\frac{\alpha}{\beta}+\frac{\beta}{\alpha}$ is $\boxed{\frac{-25}{12}}$ .

Polynomials Ex 2.1 Q4

**Answer :**

Since $\alpha$ and $\beta$ are the zeros of the quadratic polynomials $f(x)=x^2-x-4$

sum of the zeros = $\frac{-\text{Coefficient of } x}{\text{Coefficient of } x^2}$

$$\alpha+\beta=-\left[-\frac{1}{1}\right]$$

$$\alpha+\beta=\frac{1}{1}$$

$$\alpha+\beta=1$$

Product if zeros = $\frac{\text{Constant term}}{\text{Coefficient of } x^2}$

$$\alpha\beta=\frac{-4}{1}$$

$\alpha\beta$=-4

We have,

$$\frac{1}{\alpha}+\frac{1}{\beta}-\alpha\beta$$

$$\frac{\alpha+\beta}{\alpha\beta}-\alpha\beta$$

By substituting $\alpha+\beta=1$ and $\alpha\beta=-4$ we get ,

$$\frac{1}{\alpha}+\frac{1}{\beta}-\alpha\beta=\frac{1}{-4}-(-4)$$

$$\frac{1}{\alpha}+\frac{1}{\beta}-\alpha\beta=\frac{1}{-4}+\frac{4}{1}$$

$$\frac{1}{\alpha}+\frac{1}{\beta}-\alpha\beta=\frac{1}{-4}+\frac{4\times4}{1\times4}$$

$$\frac{1}{\alpha}+\frac{1}{\beta}-\alpha\beta=\frac{1}{-4}+\frac{16}{4}$$

$$\frac{1}{\alpha}+\frac{1}{\beta}-\alpha\beta=\frac{-1+16}{4}$$

$$\frac{1}{\alpha}+\frac{1}{\beta}-\alpha\beta=\frac{15}{4}$$

Hence, the value of $\frac{1}{\alpha}+\frac{1}{\beta}-\alpha\beta$ is $\boxed{\frac{15}{4}}$.

********** END **********