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NUMBER SYSTEM

ASSIGNMENT NO. 21

1. If $x = \frac{\sqrt{2}-1}{\sqrt{2}+1}$ and $y = \frac{\sqrt{2}-1}{\sqrt{2}+1}$, find the value of $x^2 + y^2 + xy$.
2. Simplify: $9^{\frac{3}{2}} - 3 \times 5^0 - \left(\frac{1}{81}\right)^{-\frac{1}{2}}$
3. Simplify the product: $4\sqrt{3} + 3\sqrt{2}) \times \left(4\sqrt{3} - 3\sqrt{2}\right)$
4. Rationalise the denominator of $\frac{30}{5\sqrt{3}-3\sqrt{5}}$
5. Show that: $(x^{a-b})^{a+b}.(x^{b-c})^{b+c}.(x^{c-a})^{c+a} = 1$
6. Express $0.3\overline{28}$ in the form of $\frac{p}{q}$, where p, q are integers and $q \neq 0$.
7. If $a = \frac{2-\sqrt{5}}{2+\sqrt{5}}$ and $b = \frac{2+\sqrt{5}}{2-\sqrt{5}}$, find $a^2 - b^2$.
8. Evaluate: $\frac{15}{\sqrt{10}+\sqrt{20}+\sqrt{40}-\sqrt{5}-\sqrt{80}}$ is being given that $\sqrt{5} = 2.2$ and $\sqrt{10} = 3.2$
9. If $x = 3 - 2\sqrt{2}$, find the value of $\sqrt{x} + \frac{1}{\sqrt{x}}$
10. If $\sqrt{2} = 1.414, \sqrt{3} = 1.732$, then find the value of $\frac{4}{3\sqrt{3}-2\sqrt{2}} + \frac{3}{3\sqrt{3}+2\sqrt{2}}$