NUMBER SYSTEM

ASSIGNMENT NO. 25

1. If $x = 3 + 2\sqrt{2}$, find the value of $x^2 + \frac{1}{x^2}$
2. Find the value of a and b, if $\frac{3+\sqrt{7}}{3-\sqrt{7}} = a + b\sqrt{7}$
3. Simplify the expression: $\frac{1}{\sqrt{2}+1} + \frac{1}{\sqrt{3}+\sqrt{2}} + \frac{1}{\sqrt{4}+\sqrt{3}} + \frac{1}{\sqrt{5}+\sqrt{4}}$
4. If $x = \frac{\sqrt{5}-2}{\sqrt{5}-2}$ and $y = \frac{\sqrt{5}+2}{\sqrt{5}-2}$, then show that $x^2 - y^2 = -144\sqrt{5}$
5. If $5^{2x-1} - 25^{x-1} = 2500$, find the value of x.
6. Find and irrational number between $\frac{1}{7}$ and $\frac{2}{7}$, when it is given that $\frac{1}{7} = 0.\overline{142857}$
7. Find the value of $\frac{1}{1+\sqrt{2}} + \frac{1}{\sqrt{2}+\sqrt{3}}$
8. If $\frac{2\sqrt{2}-3}{2\sqrt{2}+3} = a + \sqrt{2}b$, then find the value of a and b.
9. Represent $\sqrt{3}$ on the number line.
10. Arrange in descending order: $\sqrt[3]{2}$, $\sqrt[4]{5}$, $\sqrt[6]{7}$ and $\sqrt[12]{3}$.