Ch-1 Number System

1. Find two rational numbers between 0.1 and 0.3.
2. Express $3\frac{1}{8}$ in the form of decimal.
3. Simplify : $(4+\sqrt{3})(4-\sqrt{3})$.
4. Rationalize the denominator of $\frac{1}{\sqrt{3}-\sqrt{2}}$.
5. Express $0.\overline{245}$ as a fraction in the simplest form.
6. Simplify $11.45\overline{65} \div 2.\overline{67}$.
7. If x = $2+\sqrt{3}$, find the value of $x^2+\frac{1}{x^2}$.
8. What is the value of $3\sqrt{3}+\sqrt{3}$?
9. Every whole number is a natural number. Write true or false.
10. If x = $\frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ and y = $\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$, find the value of $x^2 + y^2 + xy$.
11. If x = $\frac{2-\sqrt{5}}{2+\sqrt{5}}$ and y = $\frac{2+\sqrt{5}}{2-\sqrt{5}}$, find the value of $x^2 - y^2$.
12. Determine rational numbers p and q if $\frac{7+\sqrt{5}}{7-\sqrt{5}} - \frac{7-\sqrt{5}}{7+\sqrt{5}} = p - 7\sqrt{5}q$.
13. Simplify : $\frac{6}{\sqrt{3}-\sqrt{6}}+\frac{\sqrt{6}}{\sqrt{3}+\sqrt{2}}-\frac{4\sqrt{3}}{\sqrt{6}-\sqrt{2}}$.
14. Simplify : $\frac{3\sqrt{2}}{\sqrt{6}-\sqrt{3}}+\frac{2\sqrt{3}}{\sqrt{6}+2}-\frac{4\sqrt{3}}{\sqrt{6}-\sqrt{2}}$.
15. Show that : $\frac{1}{3-\sqrt{8}}-\frac{1}{\sqrt{8}-\sqrt{7}}+\frac{1}{\sqrt{7}-\sqrt{6}}-\frac{1}{\sqrt{6}-\sqrt{5}}+\frac{1}{\sqrt{5}-2} = 5$.
16. If x = $\frac{\sqrt{p+q}+\sqrt{p-q}}{\sqrt{p+q}-\sqrt{p-q}}$, then find the value of $qx^2 - 2px + q$.
17. Show that : $\frac{x^{-1}+y^{-1}}{x^{-1}} + \frac{x^{-1}-y^{-1}}{x^{-1}} = \frac{x^2+y^2}{xy}$.
18. If x = $2 + 3\sqrt{2}$, then find the value of $\left(x+\frac{14}{x}\right)$.
19. The decimal expansion of $\frac{13}{625}$ will terminate after how many places of decimal?
20. Express 32760 as a product of Prime factors.