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NUMBER SYSTEM

ASSIGNMENT 3

1. The simplified form of $\frac{13^{\frac{1}{5}}}{13^{\frac{1}{3}}}$ is:

a. $13^{\frac{2}{15}}$ b. $13^{\frac{8}{15}}$ c. $13^{\frac{1}{3}}$ d. $13^{\frac{-2}{15}}$

2. Represent $\sqrt{2}$ on the number line.
3. If $x = 3 + 2\sqrt{2}$, then find whether $x + \frac{1}{x}$ is rational or irrational.
4. Express $18.\overline{48}$ in the form $\frac{p}{q}$ where p and q are integers, $q \neq 0$.
5. If $x = 5 - 2\sqrt{6}$, then find the value of $x^2 + \frac{1}{x^2}$
6. If $x = (2+\sqrt{5})^{\frac{1}{2}} + (2-\sqrt{5})^{\frac{1}{2}}$ and $y = (2+\sqrt{5})^{\frac{1}{2}} - (2-\sqrt{5})^{\frac{1}{2}}$, then evaluate x^2+y^2
7. If $a = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ and $b = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$, find the value of $a^2 + b^2 - 5ab$
8. Rationalize the denominator of $\frac{4}{2+\sqrt{3}+\sqrt{7}}$