

1. If $a = 9 - 4\sqrt{5}$, find the value of $a^2 - \frac{1}{a^2}$
2. If $x = 3 + 2\sqrt{2}$, find the value of $x^2 + \frac{1}{x^2}$
3. Represent $\sqrt{3.5}$ on the number line.
4. Simplify the following by rationalising the denominator: $\frac{2\sqrt{6}}{\sqrt{2}+\sqrt{3}} + \frac{6\sqrt{2}}{\sqrt{6}+\sqrt{3}} + \frac{8}{\sqrt{6}+\sqrt{2}}$
5. If $\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}} + \frac{7(\sqrt{5}-2\sqrt{3})}{\sqrt{5}+2\sqrt{3}} = a - \sqrt{15}b$, find the values of a and b .
6. Simplify: $\left(\frac{81}{16}\right)^{-\frac{3}{4}} \times \left[\left(\frac{25}{9}\right)^{-\frac{3}{2}} \div \left(\frac{5}{2}\right)^{-3}\right]$
7. Find the product of $5\sqrt{2}(3 + \sqrt{2})(5 + \sqrt{2})$
8. Evaluate: $(\sqrt{5} + \sqrt{2})^2 - (\sqrt{8} - \sqrt{3})^2$
9. If $x = 8 - 4\sqrt{3}$, find the values of $x^2 + \frac{256}{x^2}$
10. If $2^x \times 4^x = (8)^{\frac{1}{3}} \times (32)^{\frac{1}{5}}$, find the value of x .