

1. Find the values of  $a$  and  $b$ , if:  $\frac{\sqrt{2}+\sqrt{3}}{3\sqrt{2}-2\sqrt{3}} = a + b\sqrt{6}$
2. If  $p = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ ,  $q = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$ , then find the value of  $p^2 + q^2$
3. Simplify:  $\frac{6}{2\sqrt{3}-\sqrt{6}} + \frac{\sqrt{6}}{\sqrt{3}+\sqrt{2}} - \frac{4\sqrt{3}}{\sqrt{6}-\sqrt{2}}$
4. If  $\frac{2+\sqrt{3}}{2-\sqrt{3}} + \frac{2-\sqrt{3}}{2+\sqrt{3}} + \frac{\sqrt{3}-1}{\sqrt{3}+1} = a + b\sqrt{3}$ , find the rational numbers  $a$  and  $b$ .
5. Simplify:  $5\sqrt{8} + 2\sqrt{32} - 2\sqrt{2}$
6. Represent  $\sqrt{7.5}$  on the number line geometrically.
7. Evaluate:  $\left[81^{\frac{1}{2}} \left(64^{\frac{1}{3}} + 125^{\frac{1}{3}}\right)^3\right]^{\frac{1}{4}}$
8. Simplify:  $\frac{5+\sqrt{3}}{7-4\sqrt{3}} - \frac{5+\sqrt{3}}{7+4\sqrt{3}}$
9. Simplify:  $\frac{2\sqrt{6}}{\sqrt{2}+\sqrt{3}} + \frac{6\sqrt{2}}{\sqrt{6}+\sqrt{3}} - \frac{8\sqrt{3}}{\sqrt{6}+\sqrt{2}}$
10. If  $a = \frac{2-\sqrt{5}}{2+\sqrt{5}}$  and  $b = \frac{2+\sqrt{5}}{2-\sqrt{5}}$ , then find  $(a + b)^3$