

1. Simplify by rationalising the denominator:  $\frac{7\sqrt{3}}{\sqrt{10}+\sqrt{3}} - \frac{2\sqrt{5}}{\sqrt{6}+\sqrt{5}} - \frac{3\sqrt{2}}{\sqrt{15}+3\sqrt{2}}$
2. Express  $\frac{2157}{625}$  in decimal form and state whether it is terminating or not.
3. Represent  $\sqrt{13}$  on the number line.
4. Find  $a$  and  $b$  if  $\frac{2\sqrt{5}-\sqrt{7}}{2\sqrt{5}+\sqrt{7}} = a - b\sqrt{35}$
5. Simplify  $\left[5 \left\{\left(\frac{1}{8}\right)^{-\frac{1}{3}} + \left(\frac{1}{27}\right)^{-\frac{1}{3}}\right\}\right]^2 \right]^{\frac{1}{4}}$
6. If  $x = \frac{3+\sqrt{2}}{3-\sqrt{2}}$  and  $y = \frac{3-\sqrt{2}}{3+\sqrt{2}}$ , find  $x^2 + y^2$ .
7. If  $5^{2x-1} - (25)^{x-1} = 2500$ , find the value of  $x$ .
8. Simplify by rationalising the denominator:  $\frac{\sqrt{6}}{\sqrt{2}+\sqrt{3}} + \frac{3\sqrt{2}}{\sqrt{6}+\sqrt{3}} - \frac{4\sqrt{3}}{\sqrt{6}+\sqrt{2}}$
9. Express the decimal number  $2.2\overline{18}$  in the form  $\frac{p}{q}$  where  $p$  and  $q$  are integers and  $q \neq 0$ .
10. Represent  $\sqrt{3}$  on the number line.