If $a = 3 - 2\sqrt{2}$, find the value of $a^2 - \frac{1}{a^2}$ | Ans: $-24\sqrt{2}$

(16): If $x = \sqrt{13} + 2\sqrt{3}$, find the value of $x - \frac{1}{x}$ | Ans: $4\sqrt{3}$

2(17): If $x = 2 + \sqrt{3}$, find the value of $x^3 + \frac{1}{x^3}$ | Ans: 52

2(18): If $x = \frac{5-\sqrt{3}}{5+\sqrt{3}}$ and $y = \frac{5+\sqrt{3}}{5-\sqrt{3}}$ show that

$$x - y = -\frac{10\sqrt{3}}{11}$$

Ans: prove

2(19): If $a = \frac{\sqrt{5}+\sqrt{2}}{\sqrt{5}-\sqrt{2}}$ and $b = \frac{\sqrt{5}-\sqrt{2}}{\sqrt{5}+\sqrt{2}}$ show that

$$3a^2 + 4ab - 3b^2 = 4 + \frac{56}{3}\sqrt{3}$$

Ans: prove

2(20): 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

$a^2 + b^2 - 5ab$.

Ans: 93

2(21): If $p = \frac{3-\sqrt{5}}{3+\sqrt{5}}$ and $q = \frac{3+\sqrt{5}}{3-\sqrt{5}}$ find the value of $(p^2 + q^2)$ | Ans: 4

2(22): Rationalise the denominator of each of the following

(i) $\frac{1}{\sqrt{7}+\sqrt{6}-\sqrt{13}}$ Ans: $\frac{7\sqrt{6}+6\sqrt{7}+\sqrt{546}}{18}$

(ii) $\frac{3}{\sqrt{3}+\sqrt{5}-\sqrt{2}}$ Ans: $\frac{2\sqrt{3}-3\sqrt{2}-\sqrt{30}}{4}$

(iii) $\frac{4}{2+\sqrt{3}+\sqrt{7}}$ Ans: $\frac{2\sqrt{3}-\sqrt{21}+3}{3}$

2(23): Given, $\sqrt{2} = 1.414$ and $\sqrt{6} = 2.449$, find the value of $\frac{1}{\sqrt{3}-\sqrt{2}-1}$ correct to 3 place of decimal. | Ans: -1.466

2(24): if $x = \frac{1}{2-\sqrt{3}}$, find the value of $x^3 - 2x^2 - 7x + 5$

Ans: 03

2(25): Evaluate $\frac{15}{\sqrt{10}+\sqrt{20}+\sqrt{40}-\sqrt{5}-\sqrt{80}}$, it being given that $\sqrt{5} = 2.236$ and $\sqrt{10} = 3.162$

Hint: $\frac{15}{\sqrt{10}+\sqrt{20}+\sqrt{40}-\sqrt{5}-\sqrt{80}} = \frac{15}{\sqrt{10}+2\sqrt{5}+2\sqrt{10}-\sqrt{5}-4\sqrt{5}} = \frac{15}{3\sqrt{10}-3\sqrt{5}}$

$$= \frac{5}{\sqrt{10}-\sqrt{5}}$$

Ans: 5.398