2.9

1) $8^{\frac{1}{3}} = (2^3)^{\frac{1}{3}} = 2^{3\cdot\frac{1}{3}} = 2^1 = 2$

2) $16^{\frac{1}{2}} = (2^4)^{\frac{1}{2}} = 2^{4\cdot\frac{1}{2}} = 2^2 = 4$

3) $5^{-1} = \dfrac{1}{5^1} = \dfrac{1}{5}$

4) $9^{-\frac{1}{2}} = (3^2)^{-\frac{1}{2}} = 3^{2\cdot(-\frac{1}{2})} = 3^{-1} = \dfrac{1}{3^1} = \dfrac{1}{3}$

5) $27^{-\frac{1}{3}} = (3^3)^{-\frac{1}{3}} = 3^{3\cdot(-\frac{1}{3})} = 3^{-1} = \dfrac{1}{3^1} = \dfrac{1}{3}$

6) $2^{\frac{1}{2}} = \sqrt[2]{2^1} = \sqrt{2}$

7) $4^{-\frac{1}{4}} = (2^2)^{-\frac{1}{4}} = 2^{2\cdot(-\frac{1}{4})} = 2^{-\frac{1}{2}} = \dfrac{1}{2^{\frac{1}{2}}} = \dfrac{1}{\sqrt{2}} = \dfrac{\sqrt{2}}{2}$

8) $\left(\dfrac{2}{3}\right)^{-1} = \dfrac{2^{-1}}{3^{-1}} = \dfrac{\frac{1}{2^1}}{\frac{1}{3^1}} = \dfrac{\frac{1}{2}}{\frac{1}{3}} = \dfrac{1}{2}\cdot\dfrac{3}{1} = \dfrac{3}{2}$

9) $\left(\dfrac{4}{9}\right)^{\frac{1}{2}} = \left(\dfrac{2^2}{3^2}\right)^{\frac{1}{2}} = \dfrac{(2^2)^{\frac{1}{2}}}{(3^2)^{\frac{1}{2}}} = \dfrac{2^{2\cdot\frac{1}{2}}}{3^{2\cdot\frac{1}{2}}} = \dfrac{2^1}{3^1} = \dfrac{2}{3}$

10) $\left(\dfrac{16}{25}\right)^{-\frac{1}{2}} = \left(\dfrac{2^4}{5^2}\right)^{-\frac{1}{2}} = \dfrac{(2^4)^{-\frac{1}{2}}}{(5^2)^{-\frac{1}{2}}} = \dfrac{2^{4\cdot(-\frac{1}{2})}}{5^{2\cdot(-\frac{1}{2})}} = \dfrac{2^{-2}}{5^{-1}} = \dfrac{\frac{1}{2^2}}{\frac{1}{5^1}} = \dfrac{\frac{1}{4}}{\frac{1}{5}} = \dfrac{5}{4}$

11) $\left(\dfrac{25}{16}\right)^{\frac{1}{4}} = \left(\dfrac{5^2}{2^4}\right)^{\frac{1}{4}} = \dfrac{(5^2)^{\frac{1}{4}}}{(2^4)^{\frac{1}{4}}} = \dfrac{5^{2\cdot\frac{1}{4}}}{2^{4\cdot\frac{1}{4}}} = \dfrac{5^{\frac{1}{2}}}{2^1} = \dfrac{\sqrt{5}}{2}$

12) $8^{\frac{2}{3}} = (2^3)^{\frac{2}{3}} = 2^{3\cdot\frac{2}{3}} = 2^2 = 4$

13) $16^{-\frac{3}{4}} = (2^4)^{-\frac{3}{4}} = 2^{4\cdot(-\frac{3}{4})} = 2^{-3} = \dfrac{1}{2^3} = \dfrac{1}{8}$

14) $36^{\frac{5}{2}} = (6^2)^{\frac{5}{2}} = 6^{2\cdot\frac{5}{2}} = 6^5 = 7776$

15) $2^{\frac{7}{2}} = \sqrt[2]{2^7} = \sqrt{2^{3\cdot2+1}} = \sqrt{(2^3)^2\cdot 2} = 2^3\sqrt{2} = 8\sqrt{2}$

16) $\left(\frac{1}{25}\right)^{\frac{5}{2}} = \left(\dfrac{1}{5^2}\right)^{\frac{5}{2}} = (5^{-2})^{\frac{5}{2}} = 5^{(-2)\cdot\frac{5}{2}} = 5^{-5} = \dfrac{1}{5^5} = \dfrac{1}{3125}$

17) $\left(\dfrac{4}{9}\right)^{-\frac{3}{2}} = \left(\dfrac{2^2}{3^2}\right)^{-\frac{3}{2}} = \dfrac{(2^2)^{-\frac{3}{2}}}{(3^2)^{-\frac{3}{2}}} = \dfrac{2^{2\cdot(-\frac{3}{2})}}{3^{2\cdot(-\frac{3}{2})}} = \dfrac{2^{-3}}{3^{-3}} = \dfrac{\frac{1}{2^3}}{\frac{1}{3^3}} = \dfrac{\frac{1}{8}}{\frac{1}{27}} = \dfrac{27}{8}$

18) $625^{0,5} = (5^4)^{\frac{1}{2}} = 5^{4\cdot\frac{1}{2}} = 5^2 = 25$

19) $4^{1,5} = (2^2)^{\frac{3}{2}} = 2^{2\cdot\frac{3}{2}} = 2^3 = 8$

20) $2^{-3,5} = 2^{-\frac{7}{2}} = \dfrac{1}{2^{\frac{7}{2}}} = \dfrac{1}{\sqrt[2]{2^7}} = \dfrac{1}{\sqrt{2^{3\cdot 2+1}}} = \dfrac{1}{\sqrt{(2^3)^2 \cdot 2}} = \dfrac{1}{2^3\sqrt{2}}$
$= \dfrac{\sqrt{2}}{2^3 \cdot 2} = \dfrac{\sqrt{2}}{2^4} = \dfrac{\sqrt{2}}{16}$

21) $9^{1,75} = (3^2)^{\frac{175}{100}} = (3^2)^{\frac{7}{4}} = 3^{2\cdot\frac{7}{4}} = 3^{\frac{7}{2}} = \sqrt[2]{3^7} = \sqrt{3^{3\cdot 2+1}} = \sqrt{(3^3)^2 \cdot 3}$
$= 3^3\sqrt{3} = 27\sqrt{3}$

22) $0{,}25^{0,5} = \left(\dfrac{1}{4}\right)^{\frac{1}{2}} = \left(\dfrac{1}{2^2}\right)^{\frac{1}{2}} = (2^{-2})^{\frac{1}{2}} = 2^{-2\cdot\frac{1}{2}} = 2^{-1} = \dfrac{1}{2^1} = \dfrac{1}{2}$