

Write each expression in simplified form.

1. $\sqrt{125}$

$$\sqrt{125} = 5^{\sqrt{25}} = 5 \sqrt{5}$$

2. $\sqrt{112}$

$$\sqrt{112} = 4^{\sqrt{28}} = 2 \cdot 2 \sqrt{7} = 4\sqrt{7}$$

3. $\sqrt{243}$

$$\sqrt{243} = 3^{\sqrt{81}} = 9 \sqrt{3}$$

4. $\sqrt{396}$

$$\sqrt{396} = 4^{\sqrt{99}} = 2 \cdot 2 \sqrt{11} = 6\sqrt{11}$$

5. $\sqrt{12}$

$$\sqrt{12} = 4^{\sqrt{3}} = 2\sqrt{3}$$

6. $\sqrt{18}$

$$\sqrt{18} = 9^{\sqrt{2}} = 3\sqrt{2}$$

7. $\sqrt{160}$

$$\sqrt{160} = 5^{\sqrt{32}} = 2 \cdot 2 \sqrt{5 \cdot 2} = 4\sqrt{10}$$

8. $\sqrt{242}$

$$\sqrt{242} = 2^{\sqrt{121}} = 11\sqrt{2}$$

9. $\sqrt{484}$

$$\sqrt{484} = 4^{\sqrt{121}} = 2 \cdot 11 = 22$$

10. $\sqrt{144}$

$\begin{array}{c} \wedge \\ 12 \ 12 \end{array}$

$= 12$

11. $10\sqrt{600}$

$\begin{array}{c} 30 \wedge 20 \\ 6 \wedge 5 \ 5 \wedge 4 \\ 3 \ 2 \quad 2 \ 2 \end{array}$

$10 \cdot 2 \cdot 5 \sqrt{3 \cdot 2}$

$100\sqrt{6}$

12. $4\sqrt{605}$

$\begin{array}{c} 5 \wedge 121 \\ 11 \ 11 \end{array}$

$= 4 \cdot 11 \sqrt{5}$

$44\sqrt{5}$

13. $4\sqrt{192}$

$\begin{array}{c} 4 \wedge 48 \\ 2 \ 2 \quad 12 \ 4 \\ 4 \ 3 \quad 2 \ 2 \end{array}$

$4 \cdot 2 \cdot 2 \cdot 2 \sqrt{3}$

$32\sqrt{3}$

14. $20\sqrt{180}$

$\begin{array}{c} 60 \ 3 \\ 3 \ 20 \\ 5 \ 4 \\ 2 \ 2 \end{array}$

$20 \cdot 3 \cdot 2 \sqrt{5}$

$120\sqrt{5}$

15. $9\sqrt{648}$

$\begin{array}{c} 36 \wedge 18 \\ 6 \ 6 \quad 2 \ 9 \\ 3 \ 3 \end{array}$

$9 \cdot 6 \cdot 3 \sqrt{2}$

$162\sqrt{2}$

Answers:

1. $5\sqrt{5}$
2. $4\sqrt{7}$
3. $9\sqrt{3}$
4. $6\sqrt{11}$
5. $2\sqrt{3}$
6. $3\sqrt{2}$
7. $4\sqrt{10}$
8. $11\sqrt{2}$
9. 22

10. 12

11. 100v6

12. 44v5

13. 32v3

14. 120v5

15. 162v2