Name: 9.1 AK

Simplifying Radicals

$1^2 = 1$ $2^2 = 4$ $3^2 = 9$ $4^2 = 16$ $5^2 = 25$ $6^2 = 36$ $7^2 = 49$ $8^2 = 64$ $9^2 = 81$

Simplify.

1) $\sqrt{75} = \sqrt{25 \cdot 3}$
$\sqrt{25}\sqrt{3}$
$5\sqrt{3}$

2) $\sqrt{16} = 4$

3) $\sqrt{36} = 6$

4) $\sqrt{64} = 8$

5) $\sqrt{80} = \sqrt{16 \cdot 5}$
$\sqrt{16}\sqrt{5}$
$4\sqrt{5}$

6) $\sqrt{30} = \sqrt{2 \cdot 3 \cdot 5}$
↳ No perfect square factors ↳ $\sqrt{30}$

7) $\sqrt{8} = \sqrt{4 \cdot 2}$
$\sqrt{4}\sqrt{2}$
$2\sqrt{2}$

8) $\sqrt{18} = \sqrt{9 \cdot 2}$
$\sqrt{9}\sqrt{2}$
$3\sqrt{2}$

9) $\sqrt{32} = \sqrt{16 \cdot 2}$
$\sqrt{16}\sqrt{2}$
$4\sqrt{2}$

10) $\sqrt{12} = \sqrt{4 \cdot 3}$
$\sqrt{4}\sqrt{3}$
$2\sqrt{3}$

11) $\sqrt{8} = 2\sqrt{2}$

12) $\sqrt{108} = \sqrt{36 \cdot 3}$
$\sqrt{36}\sqrt{3}$
$6\sqrt{3}$

13) $\sqrt{125} = \sqrt{25 \cdot 5}$
$\sqrt{25}\sqrt{5}$
$5\sqrt{5}$

14) $\sqrt{50} = \sqrt{25 \cdot 2}$
$\sqrt{25}\sqrt{2}$
$5\sqrt{2}$

15) $\sqrt{175}$ $\sqrt{25 \cdot 7}$
$\sqrt{25}\sqrt{7}$
$5\sqrt{7}$

16) $\sqrt{28} = \sqrt{4 \cdot 7}$
$\sqrt{4}\sqrt{7}$
$2\sqrt{7}$

Notes

$\sqrt{xy} = \sqrt{x}\sqrt{y}$

$\frac{\sqrt{x}}{\sqrt{y}} = \sqrt{\frac{x}{y}}$

$\left(\sqrt{x}\right)^2 = x$

$\sqrt{x} + \sqrt{x} + \sqrt{y} = 2$

$\frac{6}{\sqrt{2}} = \frac{6}{\sqrt{2}}\left(\frac{\sqrt{2}}{\sqrt{2}}\right) = \frac{6\sqrt{2}}{2} = 3\sqrt{2}$

$(2\sqrt{5})(7\sqrt{3}) = 14\sqrt{15}$

Simplify

17) $\frac{\sqrt{20}}{\sqrt{5}} : \sqrt{\frac{20}{5}} = \sqrt{4} = 2$

18) $(5\sqrt{2})(5\sqrt{2}) = 25 \cdot \sqrt{4}$
$25 \cdot 2$
50

19) $(\sqrt{6})^2 = 6$

20) $(3\sqrt{7})^2 = (3\sqrt{7})(3\sqrt{7})$
$3 \cdot 3\sqrt{7 \cdot 7}$
$9\sqrt{49}$
$9 \cdot 7 = 63$

21) $(2\sqrt{3})(5\sqrt{2}) - (4\sqrt{2})\sqrt{3}$
$10\sqrt{6} - 4\sqrt{6}$
$6\sqrt{6}$

22) $2\sqrt{5} + 5\sqrt{2} - \sqrt{5}$
$2\sqrt{5} - \sqrt{5} + 5\sqrt{2}$
$\sqrt{5} + 5\sqrt{2}$

23) $\frac{9}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{9\sqrt{3}}{3} = 3\sqrt{3}$

24) $4\sqrt{27} = 4\sqrt{9 \cdot 3}$
$4\sqrt{9}\sqrt{3}$
$4 \cdot 3\sqrt{3}$
$12\sqrt{3}$