

1. Write the simplified radical form of each of the following:

a. $\sqrt{108}$ b. $12\sqrt{24}$ c. $\sqrt[3]{480}$ d. $\frac{2}{3}\sqrt{63}$

2. Write each as an entire radical:

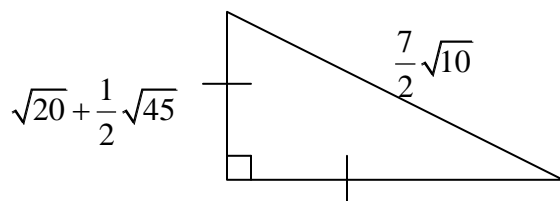
a. $24\sqrt{6}$ b. $-3\sqrt{6}$ c. $9\sqrt[3]{7}$ d. $5\sqrt[4]{3}$

3. Order from least to greatest: $6\sqrt{2}$, $2\sqrt{16}$, $4\sqrt{7}$, $7\sqrt{6}$

4. Simplify:

a. $5\sqrt{7} - 2\sqrt{7}$ e. $4\sqrt{5} - 11\sqrt{5} + 3\sqrt{5}$
 b. $8\sqrt{24} - 2\sqrt{54}$ f. $4\sqrt{5} - 2\sqrt{75} + 3\sqrt{25}$
 c. $\frac{1}{2}\sqrt{8} - \frac{2}{3}\sqrt{18}$ g. $3\sqrt{27} - 2\sqrt{50} + 5\sqrt{75} + 2\sqrt{32}$
 d. $\sqrt{48} - 6\sqrt{18} + 3\sqrt{75}$ h. $\frac{1}{2}\sqrt{12} + \frac{5}{3}\sqrt{27} - \frac{2}{3}\sqrt{18}$

5. Find the perimeter of:



6. Multiply and simplify:

a. $5\sqrt{10} \times 4\sqrt{6}$ e. $\sqrt{3}(\sqrt{11} + \sqrt{2})$
 b. $\sqrt{8}(\sqrt{12} - \sqrt{18})$ f. $3\sqrt{2}(2\sqrt{2} - 5\sqrt{8})$
 c. $\sqrt{3}(2\sqrt{5} - 3\sqrt{12})$ g. $(5 + 3\sqrt{2})(4 - \sqrt{2})$
 d. $(3 - 2\sqrt{5})^2$ h. $(\sqrt{2} + 3)(\sqrt{5} - 7\sqrt{9})$

7. Divide. Simplify where possible.

a. $\frac{12\sqrt{6}}{3\sqrt{2}}$

b. $-\frac{5\sqrt{21}}{10\sqrt{3}}$

c. $\frac{4\sqrt{27}}{\sqrt{3}}$

d. $\frac{2}{\sqrt{6}}$

e. $\frac{3}{\sqrt{2}}$

f. $\sqrt{\frac{5}{3}}$

g. $\frac{4}{\sqrt{20}}$

h. $\frac{2}{3\sqrt{12}}$

i. $\frac{5\sqrt{48}}{2\sqrt{27}}$

j. $\frac{4+3\sqrt{2}}{\sqrt{8}}$

k. $\frac{5\sqrt{3}-7}{\sqrt{3}}$

l. $\frac{2\sqrt{32}-5\sqrt{2}}{7\sqrt{2}}$

8. State the restrictions.

a. $\sqrt{x-5}$

b. $\sqrt{x^5y^8}$

c. $\frac{3}{\sqrt{x+2}}$

9. Simplify.

a. $\sqrt{125m^3}$

b. $\sqrt{100x^3y^6}$

c. $-5\sqrt{80x^4y^7}$

10. Multiply and write in simplified radical form.

a. $\sqrt{15n^2} \cdot \sqrt{10n^3}$

b. $\sqrt{18a^2} \cdot 4\sqrt{3a^2}$

c. $-3\sqrt{7r^3} \cdot 6\sqrt{7r^2}$

d. $\sqrt{6n}(7n^3 + \sqrt{12})$

e. $\sqrt{3v}(\sqrt{6} + \sqrt{10})$

f. $(5\sqrt{2x} + \sqrt{5})(-4\sqrt{2x} + \sqrt{5x})$

g. $(-3\sqrt{3k} + 4)(\sqrt{3k} - 5)$

11. Divide.

a. $\frac{\sqrt{3x^2y^3}}{4\sqrt{5xy^3}}$

b. $\frac{\sqrt{15xy}}{3\sqrt{10xy^3}}$

c. $\frac{3-3\sqrt{3a}}{4\sqrt{8a}}$

d. $\frac{3n^2 + \sqrt{2n}}{\sqrt{10n}}$

e. $\frac{4x^3 - 3\sqrt{3x}}{3\sqrt{3x^2}}$

f. $\frac{\sqrt{5k^4} + 3\sqrt{2k}}{\sqrt{3k^3}}$

12. Solve and check for extraneous roots.

a. $5 = \sqrt{x+3}$

b. $-8 + \sqrt{5a-5} = -3$

c. $\sqrt{v+3} - 1 = 7$

d. $-10\sqrt{p-10} = -60$

e. $10 + \sqrt{10m-1} = 13$

f. $\sqrt{3n+12} = \sqrt{n+8}$