

Name KEY

Write each expression in simplest radical (or root) form.

1) $2^{1/5}$ $\sqrt[5]{2}$

2) $x^{2/7}$ $\sqrt[7]{x^2}$

3) $w^{2/9}z^{1/9}$ $\sqrt[9]{w^2z}$

4) $d^{5/2}$ $d^2\sqrt{d}$
 $= \sqrt[2]{d^5} =$

5) $(121r)^{1/2}$ $11\sqrt{r}$
 $= \sqrt{121r}$

6) $(y^3)^{3/10}$ $\sqrt[10]{y^9}$
 $= \sqrt[10]{(y^3)^3}$

7) $2^{1/4}p^{5/4}$ $p\sqrt[4]{2p}$
 $= \sqrt[4]{2p^5}$

8) $64^{1/3}c^{11/3}$ $4c^3\sqrt[3]{c^2}$
 $= \sqrt[3]{64c^{11}}$

Write each radical using rational (*fraction*) exponents.

9) $\sqrt{23}$ $23^{1/2}$

10) $\sqrt[8]{x^5}$ $x^{5/8}$

11) $\sqrt[9]{9p^2q}$ $9^{1/3}p^{2/3}q^{1/3}$

12) $\sqrt{36w}$ $6w^{1/2}$

13) $\sqrt[4]{w^3z^7}$ $w^{3/4}z^{7/4}$

14) $\sqrt[8]{x^6y^{16}}$ $x^{3/4}y^2$

15) $\sqrt[3]{-8r^2}$ $-2r^{2/3}$

16) $\sqrt[12]{j^3k^7m^2}$ $j^{1/4}k^{7/12}m^{1/6}$

Evaluate each expression. Remember, evaluate means find an actual *number* for an answer.

$$17) 10,000^{1/2} \underline{100}$$

$$= \sqrt{10,000}$$

$$18) (-32)^{1/5} \underline{-2}$$

$$= \sqrt[5]{-32}$$

$$19) 4^{-1/2} \underline{\frac{1}{2}}$$

$$= \frac{1}{\sqrt{4}}$$

$$20) 64^{-2/3} \underline{\frac{1}{256}}$$

$$= \frac{1}{\sqrt[3]{64^4}} = \frac{1}{4^4}$$

$$21) 16^{3/2} \cdot 125^{2/3} \underline{1,600}$$

$$= \sqrt{16^3} \cdot \sqrt[3]{125^2}$$

$$= 4^3 \cdot 5^2$$

$$= 64 \cdot 25$$

$$22) \frac{100^{3/2}}{250} \underline{4}$$

$$= \frac{\sqrt{100^3}}{250}$$

$$= \frac{10^3}{250} = \frac{1000}{250}$$

Simplify each expression. Answers may be in either fraction-exponent or root form.

$$23) n^{2/11} \cdot n^{4/11} \underline{n^{6/11}}$$

$$24) (m^4)^{1/3} \underline{m^{4/3}}$$

$$25) \frac{y^{5/4}}{y^{1/6}} \underline{y^{13/12}}$$

$$26) j^{-2/3} \underline{\frac{j^{1/3}}{j}}$$

$$= \frac{1}{j^{2/3}} \cdot \frac{j^{1/3}}{j^{1/3}}$$

$$27) (d^{-2/3})^{-3/4} \underline{d^{1/2}}$$

$$28) \frac{5x^{3/4} \cdot x^{1/6}}{x^{7/8}} \underline{5x^{1/24}}$$

$$= \frac{5x^{11/12}}{x^{7/8}}$$

$$29) \frac{x^{1/4}}{x^{3/2} + 5} \underline{\frac{x^{7/4} - 5x^{1/4}}{x^3 - 25}}$$

$$30) \frac{10k^{-2/5}}{-2} \underline{-\frac{5k^{3/5}}{k}}$$

$$31) \sqrt[12]{81} \underline{3^{1/3} \text{ OR } \sqrt[3]{3}}$$

$$= \frac{x^{1/4} (x^{3/2} - 5)}{x^{3/2} + 5 (x^{3/2} - 5)}$$

$$= \frac{-5}{k^{2/5}} \cdot k^{3/5}$$

$$= \sqrt[12]{3 \cdot 3 \cdot 3 \cdot 3}$$

$$= \sqrt[12]{3^4}$$

$$= 3^{4/12} = 3^{1/3}$$