

Exponents - Review and Rational

Date _____ Period _____

Simplify. Your answer should contain only positive exponents.

1) $b^3 \cdot 2b^2 \cdot 4b^3$

$$8b^8$$

2) $4r^3 \cdot 4r^{-4}$

$$\frac{16}{r}$$

3) $(4n^{-3})^2$

$$\frac{16}{n^6}$$

4) $(4a^3)^{-1}$

$$\frac{1}{4a^3}$$

5) $\frac{2p^4}{2p}$

$$p^3$$

6) $\frac{v}{3v^{-4}}$

$$\frac{v^5}{3}$$

7) $\frac{2n^3}{4n^{-1}}$

$$\frac{n^4}{2}$$

8) $2vu^3 \cdot 3vu^0$

$$6v^2u$$

9) $x^{-2}y^4 \cdot 4x^{-3}y^2$

$$\frac{4y^6}{x^5}$$

10) $2a^{-4}b^2 \cdot 3ba^3$

$$\frac{6b^3}{a}$$

11) $\frac{x^{-3}y^2}{3y^2}$

$$\frac{1}{3x^3}$$

12) $\frac{4x^0y^3}{3x^{-1}y^4}$

$$\frac{4x}{3y}$$

Write each expression in radical form.

13) $b^{\frac{5}{2}}$
 $\sqrt{b^5}$

14) $(7n)^{\frac{1}{2}}$
 $\sqrt{7n}$

15) $(7n)^{\frac{4}{3}}$
 $\sqrt[3]{(7n)^4}$

16) $n^{\frac{4}{3}}$
 $\sqrt[3]{n^4}$

17) $(3n)^{\frac{3}{2}}$
 $\sqrt{(3n)^3}$

18) $x^{\frac{6}{5}}$
 $\sqrt[5]{x^6}$

Write each expression in exponential form.

19) $(\sqrt[3]{n})^5$
 $n^{\frac{5}{3}}$

20) $(\sqrt[4]{p})^3$
 $p^{\frac{3}{4}}$

21) $(\sqrt{x})^5$
 $x^{\frac{5}{2}}$

22) $(\sqrt[4]{5x})^7$
 $(5x)^{\frac{7}{4}}$

23) $(\sqrt[3]{4r})^2$
 $(4r)^{\frac{2}{3}}$

24) $(\sqrt[4]{2x})^5$
 $(2x)^{\frac{5}{4}}$

Simplify.

25) $1000^{\frac{2}{3}}$
 $\sqrt[3]{1000^2}$
100

26) $64^{\frac{1}{2}}$
8

27) $64^{\frac{1}{3}}$

4

29) $81^{\frac{3}{2}}$

729

31) $216^{\frac{4}{3}} = \sqrt[3]{216^4}$

1296

33) $81^{\frac{1}{2}}$

9

Solve each equation.

35) $v^{\frac{1}{2}} = 9$

3

37) $(n+29)^{\frac{1}{2}} + 3 = 6$

$$(n+29)^{\frac{1}{2}} = 3$$

$$n+29 = 9$$

$$n = -20$$

39) $512 = (56-b)^{\frac{3}{2}}$

$$\sqrt[3]{512^2} = 56-b$$

$$64 = 56-b$$

$$-8 = b$$

28) $36^{\frac{3}{2}}$

$$\sqrt{36^3}$$

216

30) $64^{\frac{1}{6}}$

2

32) $32^{\frac{2}{5}} = \sqrt[5]{32^2}$

4

34) $64^{\frac{3}{2}}$

512

36) $p^{-\frac{3}{2}} = \left(\frac{1}{216}\right)^{-\frac{2}{3}}$

$$p = \frac{1^{-\frac{2}{3}}}{216^{-\frac{2}{3}}} = \frac{\sqrt[3]{216^2}}{1} = 36$$

38) $4 = (2v+62)^{\frac{1}{2}}$

$$16 = 2v+62$$

$$-46 = 2v$$

$$-23 = v$$

40) $125 = (k+9)^{\frac{3}{2}}$

$$\sqrt[3]{125^2} = k+9$$

$$25 = k+9$$

$$-3- \quad 14 = k$$