

N.RN.A.2: Radicals and Rational Exponents 2

1 If $f(x) = 4x^{\frac{1}{2}}$, find $f(4)$.

2 If $f(x) = x^{\frac{3}{4}}$, find $f(16)$.

3 Find the value of $27^{\frac{4}{3}}$.

4 Find the value of $(-8)^{\frac{2}{3}}$.

5 If $f(x) = x^{-\frac{1}{2}}$, find $f(9)$.

6 If $g(x) = 36^x$, evaluate $g\left(-\frac{1}{2}\right)$.

7 If $g(x) = x^{-\frac{3}{2}}$, find $g(4)$.

8 If $f(x) = x^{\frac{2}{3}}$, find $f(-27)$.

9 If $f(x) = x^{-\frac{3}{2}}$, find $f\left(\frac{16}{9}\right)$.

10 If $g(x) = \left(\frac{1}{64}\right)^x$, find $g\left(-\frac{1}{3}\right)$.

11 Determine the exact value of $\left(\frac{27}{64}\right)^{-\frac{2}{3}}$ as a fraction in simplest form.

12 Express in *simplest form* the value of $2x^0 + x^{\frac{2}{3}}$ if $x = 27$.

13 Find the value of $2p^0 - p^{\frac{2}{3}}$ if $p = 8$.

14 If $f(x) = x^{\frac{1}{2}} + x^{-2}$, what is the value of $f(4)$?

15 If $f(x) = (16x)^0 + x^{\frac{2}{3}}$, find $f(64)$.

16 If $f(x) = x^{-2} + 27^x$, find $f\left(\frac{2}{3}\right)$ in simplest form.

24 If $f(x) = \left(x^0 + x^{\frac{1}{2}}\right)^{-2}$, find $f(9)$.

17 Find the value of the expression $2x^0 + x^{\frac{1}{3}}$ when $x = 125$.

25 Find the value of $(x+2)^0 + (x+1)^{-\frac{2}{3}}$ when $x = 7$.

18 What is the value of $3a^0 + a^{\frac{1}{2}} + 8a^{-2}$ when $a = 4$?

26 Evaluate the expression $(x+3)^{\frac{1}{2}} + (x-3)^0 + (x+2)^{-\frac{2}{3}}$ when $x = 6$.

19 If $f(x) = x^0 + x^{\frac{2}{3}} + x^{-\frac{2}{3}}$, find $f(8)$.

27 Find the numeric value of the following expression when $x = 4$, $y = 3$, $m = 1$, $n = 2$:

$$\frac{3x^n}{ny} - 2mx^{-\frac{1}{2}}y^m + 2nx^{-m}y^2$$

20 If $a = 4$, evaluate $a^{\frac{1}{2}} + a^0 + a^{-2}$.

28 Find the value of the following expression when $x = 4$, $y = 8$, $a = 3$, $b = 5$:

$$\left(4x^{\frac{1}{2}} - a^{-1}\left(y^{\frac{1}{3}} + \sqrt{x+b}\right)\right)^3$$

21 Evaluate: $-3x^0 + (8)^{\frac{2}{3}} + \left(\frac{1}{2}\right)^{-2}$

29 Use the properties of rational exponents to determine the value of y for the equation:

$$\frac{\sqrt[3]{x^8}}{\left(x^4\right)^{\frac{1}{3}}} = x^y, x > 1$$

22 If $f(x) = x^0 + x^{\frac{1}{2}} + x^{-1}$, find $f(4)$.

23 Find the value of $5x^0 + x^{-\frac{1}{2}} - x^{\frac{1}{2}}$ when $x = 16$.

30 If $10^{3.5551} = 3590$, find the value of $10^{0.5551}$.

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Answer Section

1 ANS:
8

REF: 068101siii

2 ANS:
8

REF: 089004siii

3 ANS:
81

REF: 010203siii

4 ANS:
4

REF: 088511siii

5 ANS:
 $\frac{1}{3}$

REF: 069007siii

6 ANS:
 $\frac{1}{6}$

REF: 060010siii

7 ANS:
 $\frac{1}{8}$

REF: 068611siii

8 ANS:
9

REF: 068002siii

9 ANS:
 $\frac{27}{64}$

REF: 010310siii

10 ANS:
4

REF: 060204siii

11 ANS:

$$\left(\frac{27}{64}\right)^{-\frac{2}{3}} = \left(\frac{64}{27}\right)^{\frac{2}{3}} = \left(\frac{4}{3}\right)^2 = \frac{16}{9}$$

REF: 011729a2

12 ANS:

11

REF: 018609siii

13 ANS:

-2

REF: 088614siii

14 ANS:

$$2\frac{1}{16}$$

REF: 089705siii

15 ANS:

17

REF: 019807siii

16 ANS:

$$11\frac{1}{4}$$

REF: 080206siii

17 ANS:

7

REF: 080306siii

18 ANS:

5.5

REF: 010407siii

19 ANS:

$$5\frac{1}{4}$$

REF: 069711siii

20 ANS:

$$3\frac{1}{16}$$

REF: 089810siii

21 ANS:
5

REF: 069911siii

22 ANS:
 $3\frac{1}{4}$

REF: 089901siii

23 ANS:
 $\frac{5}{4}$

REF: 010013siii

24 ANS:
 $\frac{1}{16}$

REF: 069416siii

25 ANS:
1.25. $(7+2)^0 + (7+1)^{-\frac{2}{3}} = 1 + 8^{-\frac{2}{3}} = 1 + \left(\frac{1}{8}\right)^{\frac{2}{3}} = 1 + \frac{1^{\frac{2}{3}}}{8^{\frac{2}{3}}} = 1\frac{1}{4}$

REF: 080322b

26 ANS:
4.25. $(6+3)^{\frac{1}{2}} + (6-3)^0 + (6+2)^{-\frac{2}{3}} = 9^{\frac{1}{2}} + 3^0 + 8^{-\frac{2}{3}} = 3 + 1 + \frac{1}{4} = 4\frac{1}{4}$

REF: 080921b

27 ANS:
14

REF: 019414al

28 ANS:
125

REF: 039305al

29 ANS:

$$\frac{x^{\frac{8}{3}}}{x^{\frac{4}{3}}} = x^y$$

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

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

REF: spr1505aai

30 ANS:

3.59

REF: 068614siii