

N.RN.A.2: Operations with Radicals 4

1 The expression $\left(\sqrt[3]{27x^2}\right)\left(\sqrt[3]{16x^4}\right)$ is equivalent

to

- 1) $12x^2\sqrt[3]{2}$
- 2) $12x\sqrt[3]{2x}$
- 3) $6x\sqrt[3]{2x^2}$
- 4) $6x^2\sqrt[3]{2}$

2 The product of $\sqrt[3]{4m^2}$ and $\sqrt[3]{10m}$ expressed in simplest radical form is

- 1) $\sqrt[3]{40m^3}$
- 2) $2\sqrt[3]{5m^3}$
- 3) $m\sqrt[3]{40}$
- 4) $2m\sqrt[3]{5}$

3 When simplified, the expression $\left(\sqrt[3]{m^4}\right)\left(m^{-\frac{1}{2}}\right)$ is

equivalent to

- 1) $\sqrt[3]{m^{-2}}$
- 2) $\sqrt[4]{m^3}$
- 3) $\sqrt[5]{m^{-4}}$
- 4) $\sqrt[6]{m^5}$

4 What is the product of $\sqrt[3]{4a^2b^4}$ and $\sqrt[3]{16a^3b^2}$?

- 1) $4ab^2\sqrt[3]{a^2}$
- 2) $4a^2b^3\sqrt[3]{a}$
- 3) $8ab^2\sqrt[3]{a^2}$
- 4) $8a^2b^3\sqrt[3]{a}$

5 The expression $\left(a\sqrt[3]{2b^2}\right)\left(\sqrt[3]{4a^2b}\right)$ is equivalent

to

- 1) $2ab\sqrt[3]{a^2}$
- 2) $2ab$
- 3) $2ab\sqrt[3]{2a^2}$
- 4) $2a^2b\sqrt[3]{2b}$

6 The expression $\sqrt[3]{27a^3} \cdot \sqrt[4]{16b^8}$ is equivalent to

- 1) $6ab^2$
- 2) $6ab^4$
- 3) $12ab^2$
- 4) $12ab^4$

7 Given $y > 0$, the expression $\sqrt{3x^2y} \cdot \sqrt[3]{27x^3y^2}$ is equivalent to

- 1) $81x^5y^3$
- 2) $3^{1.5}x^2y$
- 3) $3^{\frac{5}{2}}x^2y^{\frac{5}{3}}$
- 4) $3^{\frac{3}{2}}x^2y^{\frac{7}{6}}$

8 For $x > 0$, which expression is equivalent to

$$\frac{\sqrt[3]{x^2} \cdot \sqrt{x^5}}{\sqrt[6]{x}}?$$

- 1) x
- 2) $x^{\frac{3}{2}}$
- 3) x^3
- 4) x^{10}

9 Simplify:

$$\frac{\sqrt[3]{\frac{a^2}{b}}}{\sqrt[3]{\frac{a}{b^2}}}$$

10 Simplify: $\sqrt[3]{\frac{128x^6y^2}{81z^4}} \div \sqrt[3]{\frac{16x^3y^2}{3z^7}}$

11 Write $\sqrt[3]{x} \cdot \sqrt{x}$ as a single term with a rational exponent.

12 Simplify: $\sqrt{a} \times \sqrt[3]{b}$

13 Simplify: $\sqrt{a} \times \sqrt[4]{b}$

14 Simplify: $\sqrt{a^3} \times \sqrt[3]{a^2}$

15 Simplify: $\sqrt[3]{ab^2} \times \sqrt{ab^3}$

16 For positive values of x , which expression is

equivalent to $\sqrt{16x^2} \cdot x^{\frac{2}{3}} + \sqrt[3]{8x^5}$

- 1) $6\sqrt[5]{x^3}$
- 2) $6\sqrt[3]{x^5}$
- 3) $4\sqrt[3]{x^2} + 2\sqrt[3]{x^5}$
- 4) $4\sqrt{x^3} + 2\sqrt[5]{x^3}$

17 The sum of $\sqrt[3]{6a^4b^2}$ and $\sqrt[3]{162a^4b^2}$, expressed in simplest radical form, is

- 1) $\sqrt[6]{168a^8b^4}$
- 2) $2a^2b\sqrt[3]{21a^2b}$
- 3) $4a\sqrt[3]{6ab^2}$
- 4) $10a^2b\sqrt[3]{8}$

18 Simplify: $\sqrt{\frac{1}{a}} + \sqrt[3]{\frac{1}{b}}$

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Answer Section

1 ANS: 4

$$\left(\sqrt[3]{27x^2}\right)\left(\sqrt[3]{16x^4}\right) = \sqrt[3]{3^3 \cdot 2^4 \cdot x^6} = 3 \cdot 2 \cdot x^2 \sqrt[3]{2} = 6x^2 \sqrt[3]{2}$$

REF: 011421a2

2 ANS: 4

$$\sqrt[3]{4m^2} \cdot \sqrt[3]{10m} = \sqrt[3]{40m^3} = \sqrt[3]{8 \cdot 5m^3} = 2m \sqrt[3]{5}$$

REF: 081627a2

3 ANS: 4

$$\left(\sqrt[3]{m^4}\right)\left(m^{-\frac{1}{2}}\right) = m^{\frac{4}{3}} \cdot m^{-\frac{1}{2}} = m^{\frac{5}{6}} = \sqrt[6]{m^5}$$

REF: 010617b

4 ANS: 1

$$\sqrt[3]{64a^5b^6} = \sqrt[3]{4^3 a^3 a^2 b^6} = 4ab^2 \sqrt[3]{a^2}$$

REF: 011516a2

5 ANS: 1

$$\left(a^3 \sqrt{2b^2}\right)\left(\sqrt[3]{4a^2b}\right) = a^3 \sqrt{8a^2b^3} = 2ab^3 \sqrt{a^2}$$

REF: 082213aai

6 ANS: 1

$$\sqrt[3]{27a^3} \cdot \sqrt[4]{16b^8} = 3a \cdot 2b^2 = 6ab^2$$

REF: 061504a2

7 ANS: 4

$$\sqrt{3x^2y} \cdot \sqrt[3]{27x^3y^2} = 3^{\frac{1}{2}} xy^{\frac{1}{2}} \cdot 3^{\frac{2}{3}} xy^{\frac{2}{3}} = 3^{\frac{3}{2}} x^2 y^{\frac{7}{6}}$$

REF: 081914aai

8 ANS: 3

$$\frac{x^{\frac{2}{3}} \cdot x^{\frac{5}{2}}}{x^{\frac{1}{6}}} = \frac{x^{\frac{4}{6}} \cdot x^{\frac{15}{6}}}{x^{\frac{1}{6}}} = x^{\frac{18}{6}} = x^3$$

REF: 081812aai

9 ANS:

$$\sqrt[3]{ab}$$

REF: 019415al

10 ANS:

$$\frac{2xz}{3}$$

REF: 019811al

11 ANS:

$$\sqrt[3]{x} \cdot \sqrt{x} = x^{\frac{1}{3}} \cdot x^{\frac{1}{2}} = x^{\frac{2}{6}} \cdot x^{\frac{3}{6}} = x^{\frac{5}{6}}$$

REF: 061731aii

12 ANS:

$$\sqrt[6]{a^3b^2}$$

REF: 019713al

13 ANS:

$$\sqrt[4]{a^2b}$$

REF: 089603al

14 ANS:

$$a^2\sqrt[6]{a}$$

REF: 119411al

15 ANS:

$$b^2\sqrt[6]{a^5b}$$

REF: 039413al

16 ANS: 2

$$4x \cdot x^{\frac{2}{3}} + 2x^{\frac{5}{3}} = 4x^{\frac{5}{3}} + 2x^{\frac{5}{3}} = 6x^{\frac{5}{3}} = 6\sqrt[3]{x^5}$$

REF: 061820aii

17 ANS: 3

$$\sqrt[3]{6a^4b^2} + \sqrt[3]{(27 \cdot 6)a^4b^2}$$

$$a\sqrt[3]{6ab^2} + 3a\sqrt[3]{6ab^2}$$

$$4a\sqrt[3]{6ab^2}$$

REF: 011319a2

18 ANS:

$$\frac{b\sqrt{a} + a\sqrt{b^2}}{ab}$$

REF: 089710al