

A2.N.2: Operations with Radicals: Perform arithmetic operations (addition, subtraction, multiplication, division) with expressions containing irrational numbers in radical form

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

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

2 Simplify: $\sqrt{20a^3} + \sqrt{45a^5}$

3 Find the sum of $\sqrt{12a^3}$ and $\sqrt{27a^5b^2}$.

4 Simplify: $2ax\sqrt{45} + ax\sqrt{20}$

5 Simplify: $3\sqrt{242x^5y^5} + 11xy\sqrt{2x^3y^3}$

6 Express $5\sqrt{3x^3} - 2\sqrt{27x^3}$ in simplest radical form.

7 Simplify: $\sqrt{9x^5 + 18x^4y} - \sqrt{4xy^6 + 8y^7}$

8 If $x > 0$, the expression $(\sqrt{x})(\sqrt{2x})$ is equivalent to

- | | |
|----------------|------------------|
| 1) $\sqrt{2x}$ | 3) $x^2\sqrt{2}$ |
| 2) $2x$ | 4) $x\sqrt{2}$ |

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

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

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

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

11 Simplify: $\frac{3}{x-y} \sqrt{\frac{2a}{x-y}} \div \sqrt{\frac{18a^3}{(x-y)^5}}$

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

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Answer Section

1 ANS: 3

$$\begin{aligned} &\sqrt[3]{6a^4b^2} + \sqrt[3]{(27 \cdot 6)a^4b^2} \\ &a\sqrt[3]{6ab^2} + 3a\sqrt[3]{6ab^2} \\ &4a\sqrt[3]{6ab^2} \end{aligned}$$

REF: 011319a2

2 ANS:

$$(2a + 3a^2)\sqrt{5a}$$

REF: 119313a1

3 ANS:

$$(2a + 3a^2b)(\sqrt{3a})$$

REF: 119209a1

4 ANS:

$$8ax\sqrt{5}$$

REF: 089312a1

5 ANS:

$$44x^2y^2\sqrt{2xy}$$

REF: 019111a1

6 ANS:

$$5\sqrt{3x^3} - 2\sqrt{27x^3} = 5\sqrt{x^2} \sqrt{3x} - 2\sqrt{9x^2} \sqrt{3x} = 5x\sqrt{3x} - 6x\sqrt{3x} = -x\sqrt{3x}$$

REF: 061032a2

7 ANS:

$$(3x^2 - 2y^3)\sqrt{x + 2y}$$

REF: 069709a1

8 ANS: 4

REF: 010103a

9 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

10 ANS: 1

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

REF: 011516a2

11 ANS:

$$\frac{(x-y)\sqrt{a}}{a}$$

REF: 069709a1

12 ANS:

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

REF: 019811a1