Radicals With Letters and Cube Root Practice

1. The simplified result of $-5\sqrt[3]{432}-\sqrt[3]{2}$ is

   A) $-31\sqrt[3]{2}$ B) $-29\sqrt[3]{2}$ C) $-6\sqrt[3]{432}$ D) $-4\sqrt[3]{432}$

2. Express $\sqrt{75x^2y}$ is simplest form.

   A) $5\sqrt{3xy}$ B) $5x\sqrt{3y}$ C) $3\sqrt{5xy}$ D) $3x\sqrt{5y}$

3. Simplify $\sqrt{8x^6y}+3x^3\sqrt{2y}$.

   A) $5x^3y\sqrt{2}$ B) $10x^3y\sqrt{2}$ C) $5x^3\sqrt{2y}$ D) $10x^3\sqrt{2y}$

4. When $-4\sqrt{200x^9y^4}$ is simplified to the form $-40x^my^n\sqrt{2x}$, the **sum** of m and n is _____.

5. Simplify $12\sqrt[3]{135}$.

6. Simplify $\sqrt[3]{48xy^6}$

Radicals With Letters and Cube Root Practice Solutions

1. The simplified result of $-5\sqrt[3]{432}-\sqrt[3]{2}$ is

   A) $-31\sqrt[3]{2}$ Ans. B) $-29\sqrt[3]{2}$ C) $-6\sqrt[3]{432}$ D) $-4\sqrt[3]{432}$

Solution

A factor of 432 that is the radicand of a perfect cube is 216. Therefore, $\left(\sqrt[3]{216}\right)\left(\sqrt[3]{2}\right)=\sqrt[3]{432}$

The initial expression can be re-written as:

$(-5)\left(\sqrt[3]{216}\right)\left(\sqrt[3]{2}\right)-\left(\sqrt[3]{2}\right)$ Replace $\sqrt[3]{216}$ with its integer equivalent of 6.

= $(-5)(6)\left(\sqrt[3]{2}\right)-\left(\sqrt[3]{2}\right)$

= $(-30)\left(\sqrt[3]{2}\right)-\left(\sqrt[3]{2}\right)$

= $-31\sqrt[3]{2}$

The correct answer is A.

2. Express $\sqrt{75x^2y}$ is simplest form.

   A) $5\sqrt{3xy}$ B) $5x\sqrt{3y}$ Ans. C) $3\sqrt{5xy}$ D) $3x\sqrt{5y}$

Solution

$\sqrt{75x^2y}$ = $\left(\sqrt{25}\right)\left(\sqrt{3}\right)\left(\sqrt{x^2}\right)\left(\sqrt{y}\right)$

= $\left(\sqrt{25}\right)\left(\sqrt{3}\right)\left(\sqrt{x^2}\right)\left(\sqrt{y}\right)$

= $(5)\left(\sqrt{3}\right)(x)\left(\sqrt{y}\right)$

= $5x\sqrt{3y}$

The correct answer is B.

3. Simplify $\sqrt{8x^6y} + 3x^3\sqrt{2y}$.

A) $5x^3y\sqrt{2}$ B) $10x^3y\sqrt{2}$ C) $5x^3\sqrt{2y}$ D) $10x^3\sqrt{2y}$

Solution

$\sqrt{4}\sqrt{2}\sqrt{x^6}\sqrt{y} + 3x^3\sqrt{2y}$

= $2x^3\sqrt{2y} + 3x^3\sqrt{2y}$

= $5x^3\sqrt{2y}$

The correct answer is C.

4. When $-4\sqrt{200x^9y^4}$ is simplified to the form $-40x^my^n\sqrt{2x}$, the **sum** of m and n is _6__.

Solution

$-4\sqrt{200x^9y^4}$ = $(-4)(\sqrt{100})(\sqrt{2})(\sqrt{x^8})(\sqrt{x})(\sqrt{y^4})$

= $(-4)(\sqrt{100})(\sqrt{2})(\sqrt{x^8})(\sqrt{x})(\sqrt{y^4})$

= $(-4)(10)(\sqrt{2})(x^4)(\sqrt{x})(y^2)$

= $-40x^4y^2\sqrt{2x}$

The value of m is 4 and the value of n is 2. Their sum is 6.

5. Simplify $12\sqrt[3]{135}$.

Solution

= $(12)\left(\sqrt[3]{27}\right)\left(\sqrt[3]{5}\right)$

Replace the cube root of 27 with its integer equivalent of 3.

= $(12)(3)\left(\sqrt[3]{5}\right)$

= $36\left(\sqrt[3]{5}\right)$

6. Simplify $\sqrt[3]{48xy^6}$

Solution

= $\left(\sqrt[3]{8}\right)\left(\sqrt[3]{6}\right)\left(\sqrt[3]{x}\right)\left(\sqrt[3]{y^6}\right)$

= $(2)\left(\sqrt[3]{6}\right)\left(\sqrt[3]{x}\right)\left(y^2\right)$

= $2y^2\left(\sqrt[3]{6x}\right)$