6-4 Standardized Test Prep

Rational Exponents

Multiple Choice

For Exercises 1–5, choose the correct letter.

1. What is $12^{\frac{1}{3}} \cdot 45^{\frac{1}{3}} \cdot 50^{\frac{1}{3}}$ in simplest form?

   Ⓐ $\sqrt{27,000}$ Ⓑ 30   Ⓒ $107^{\frac{1}{3}}$ Ⓓ 27,000

2. What is $x^{\frac{1}{3}} \cdot y^{\frac{2}{3}}$ in simplest form?

   Ⓕ $x^3\sqrt{y^3}$ Ⓖ $\sqrt{xy^3}$ Ⓗ $\sqrt[3]{(xy)^2}$ Ⓘ $\sqrt[3]{xy^2}$

3. What is $x^{\frac{1}{3}} \cdot x^{\frac{1}{2}} \cdot x^{\frac{1}{4}}$ in simplest form?

   Ⓐ $x^{\frac{13}{12}}$ Ⓑ $x^{\frac{1}{24}}$ Ⓒ $x^{\frac{1}{9}}$ Ⓓ $x^{\frac{5}{24}}$

4. What is $\left(\dfrac{x^{\frac{2}{3}}y^{\frac{1}{3}}}{x^{\frac{1}{2}}y^{\frac{3}{4}}}\right)^6$ in simplest form?

   Ⓕ $xy^{\frac{5}{2}}$ Ⓖ $x^7y^{\frac{5}{2}}$ Ⓗ $\dfrac{1}{xy^{\frac{5}{2}}}$ Ⓘ $\dfrac{x}{y^{\frac{5}{2}}}$

5. What is $(-32x^{10}y^{35})^{-\frac{1}{5}}$ in simplest form?

   Ⓐ $2x^2y^7$ Ⓑ $-\dfrac{2}{x^2y^7}$ Ⓒ $-\dfrac{1}{2x^2y^7}$ Ⓓ $\dfrac{2}{x^2y^7}$

Short Response

6. The surface area S, in square units, of a sphere with volume V, in cubic units, is given by the formula $S = \pi^{\frac{1}{3}}(6V)^{\frac{2}{3}}$. What is the surface area of a sphere with volume $\frac{4}{3}$ mi^3? Show your work.