

BELL RINGER

1.) Simplify $(a^3)^2(2a)^4$

2.) Solve the system of equations $y = 5x - 1$
 $y = 2x + 8$

3.) Find the probability of choosing an ace or three from a standard deck of cards.

Properties of Rational Exponents and Radicals

- **Objective:** Students will be able to use properties of rational exponents and radicals to simplify expressions.
- **“I Can” Statement:** I can use properties of rational exponents and radicals to simplify expressions.
- **HSN-RN.A.2:** Rewrite expressions involving radicals and rational exponents using the properties of exponents.

Complete the table below.

HSA-SSE.2

Properties of Rational Exponents

Definition

Example

Product of Powers		
Power of a Power		
Power of a Product		
Negative Exponent		
Zero Exponent		
Quotient of Powers		
Power of a Quotient		

Complete the table below.

HSA-SSE.2

Properties of
Radicals

Definition

Example

Product Property		
Quotient Property		

Show that you can apply the properties of integer exponents to rational exponents and radicals by simplifying each expression.

$$5^{\frac{1}{3}} \cdot 5^{\frac{2}{3}} =$$

$$\sqrt[3]{5} \cdot \sqrt[3]{25} =$$

$$\left(2^{\frac{3}{4}}\right)^4 =$$

$$\sqrt{3} \cdot \sqrt{27} =$$

$$\frac{3^{\frac{5}{3}}}{\frac{1}{3^3}} =$$

$$\frac{\sqrt[4]{32}}{\sqrt[4]{2}} =$$

$$\left(\frac{7^{\frac{3}{2}}}{1}\right)^{\frac{2}{7^{\frac{3}{2}}}} =$$

$$\frac{\sqrt[3]{48}}{\sqrt[3]{3}} =$$

Show that you can apply the properties of integer exponents to rational exponents and radicals by simplifying each expression.

$$5^{\frac{1}{3}} \cdot 5^{\frac{2}{3}} = 5$$

$$\sqrt[3]{5} \cdot \sqrt[3]{25} = 5$$

$$\left(2^{\frac{3}{4}}\right)^4 = 2^3 = 8$$

$$\sqrt{3} \cdot \sqrt{27} = 9$$

$$\frac{3^{\frac{5}{3}}}{\frac{1}{3^{\frac{1}{3}}}} = 3^2 = 9$$

$$\frac{\sqrt[4]{32}}{\sqrt[4]{2}} = 2$$

$$\left(\frac{7^{\frac{3}{2}}}{\frac{1}{7^{\frac{1}{2}}}}\right)^2 = 7^2 = 49$$

$$\frac{\sqrt[3]{48}}{\sqrt[3]{3}} = \sqrt[3]{16} = 2\sqrt[3]{2}$$

Note Sheet!

Write $\sqrt[3]{2a^3b^{11}c}$ in simplest form. Assume all variables are positive.

Note Sheet!

Write $\frac{x}{\sqrt[4]{y^5}}$ in simplest form. Assume all variables are positive.

Note Sheet!

Simplify $6\sqrt{k} + 2\sqrt{k}$. Assume all variables are positive.

Note Sheet!

Simplify $\sqrt{4a^5} + 2a\sqrt{a^3}$. Assume all variables are positive.

Properties of Rational Exponents and Radicals Task Cards

There are 20 task cards for you to complete to practice simplifying rational exponents and radicals.

Properties of Rational Exponents and Radicals

Task Cards Answer Key

- | | |
|-----------------|--------------------|
| 1.) -1 | 11.) $6 + 9i$ |
| 2.) 1 | 12.) $8 + 4i$ |
| 3.) i | 13.) $41 - i$ |
| 4.) i | 14.) $15 + 29i$ |
| 5.) $-8 + 12i$ | 15.) $58 - 48i$ |
| 6.) $-10 + 14i$ | 16.) $-38 - 4i$ |
| 7.) $2 + 16i$ | 17.) $10i$ |
| 8.) $9 - 5i$ | 18.) $2i\sqrt{10}$ |
| 9.) $2 - 2i$ | 19.) $5i\sqrt{2}$ |
| 10.) $11 + 4i$ | 20.) $2i\sqrt{7}$ |

EXIT SLIP

Simplify the expression $3\sqrt{12} - 11\sqrt{3}$.

On a scale from 1-5, 5 being the greatest, how well do you understand this standard?