Which of these are rational numbers?

Rational numbers are any number that can be written as a fraction.

If a number isn't rational then it is Irrational

1. $12.8 = \frac{128}{10}$

2. $\sqrt{25} = 5 = \frac{5}{1}$

3. $\sqrt{3}$

4. $\frac{19}{7}$

Simplify as much as possible:

1. $\sqrt{6} \cdot \sqrt{6}$

$= \sqrt{6^2} = \boxed{6}$

2. $\sqrt[3]{7} \cdot \sqrt[3]{7}$

$\boxed{\sqrt[3]{7^2} \text{ or } \sqrt[3]{49}}$

This is as far as you can simplify.

What is the smallest number you could replace ? with in order to be able to do the square root?

1. $\sqrt{11 \cdot ?}$

$= \sqrt{11 \cdot 11}$

$= \sqrt{11^2} = 11$

2. $\sqrt{12 \cdot ?}$

$= \sqrt{12 \cdot 3}$

$= \sqrt{36} = 6$

What is the smallest number you could replace ? with in order to be able to do the cube root?

1. $\sqrt[3]{7^1 \cdot ?}$

$\sqrt[3]{7 \cdot 7^2}$

$\sqrt[3]{7^3}$

$= 7$

2. $\sqrt[3]{25 \cdot ?}$

$\sqrt[3]{5^2 \cdot 5}$

$\sqrt[3]{5^3}$

$= 5$

Sec 7-2: Rationalizing Denominators of Radical Expressions

To rationalize a denomintor means to remove any irrational number from the denominator.

Rationalize each denominator and simplify. Assume all variables are positive.

1. $\frac{2}{\sqrt{11}} \cdot \frac{\sqrt{11}}{\sqrt{11}}$

$= \boxed{\frac{2\sqrt{11}}{11}}$

2. $\frac{10}{\sqrt{6w}} \cdot \frac{\sqrt{6w}}{\sqrt{6w}}$

$= \frac{10\sqrt{6w}}{\sqrt{6^2w^2}}$

$= \frac{10\sqrt{6w}}{6w}$

$= \boxed{\frac{5\sqrt{6w}}{3w}}$

Rationalize each denominator and simplify.

1. $\frac{2}{\sqrt{31}} \cdot \frac{\sqrt{31}}{\sqrt{31}}$

$= \boxed{\frac{2\sqrt{31}}{31}}$

2. $\frac{7}{\sqrt{8}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{7\sqrt{2}}{\sqrt{16}}$

$= \boxed{\frac{7\sqrt{2}}{4}}$

3. $\frac{10}{\sqrt{12}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{10\sqrt{3}}{\sqrt{36}} = \frac{10\sqrt{3}}{6} = \frac{5\sqrt{3}}{3}$

Rationalize each denominator and simplify.

1. $\frac{2}{\sqrt[3]{7^1}} \cdot \frac{\sqrt[3]{7^2}}{\sqrt[3]{7^2}}$

$= \frac{2\sqrt[3]{7^2}}{\sqrt[3]{7^3}}$

$= \boxed{\frac{2\sqrt[3]{7^2}}{7}}$

2. $\frac{1}{\sqrt[3]{25}} = \frac{1}{\sqrt[3]{5^2}} \cdot \frac{\sqrt[3]{5}}{\sqrt[3]{5}}$

$= \frac{\sqrt[3]{5}}{\sqrt[3]{5^3}}$

$= \boxed{\frac{\sqrt[3]{5}}{5}}$

3. $\frac{18}{\sqrt[3]{4}} = \frac{18}{\sqrt[3]{2^2}} \cdot \frac{\sqrt[3]{2}}{\sqrt[3]{2}} = \frac{18\sqrt[3]{2}}{\sqrt[3]{2^3}}$

$= \frac{18\sqrt[3]{2}}{2}$

$= \boxed{9\sqrt[3]{2}}$

Rationalize each denominator and simplify.

1. $\frac{15}{\sqrt[4]{\underbrace{27}_{3^3}}} \cdot \frac{\sqrt[4]{3}}{\sqrt[4]{3}}$

$= \frac{15\sqrt[4]{3}}{\sqrt[4]{3^4}} = \frac{15\sqrt[4]{3}}{3} = \boxed{5\sqrt[4]{3}}$

2. $\frac{41}{\sqrt[5]{8}}$

Rationalize each denominator and simplify.

2. $\frac{41}{\sqrt[5]{8}} = \frac{41}{\sqrt[5]{2^3}} \cdot \frac{\sqrt[5]{2^2}}{\sqrt[5]{2^2}} = \frac{41\sqrt[5]{4}}{\sqrt[5]{2^5}}$

$= \boxed{\frac{41\sqrt[5]{4}}{2}}$