

Name: DhruvaniDate: 24/02/2020

Daily Check In

Learning Goal 4.1

Identify and order irrational numbers.



For each number below, write an equivalent form as the table specifies.

| | As a square root | As a cube root | As a fourth root |
|-------|------------------|---------------------|--------------------|
| 3 = | $\sqrt{9}$ | $\sqrt[3]{27^{13}}$ | $\sqrt[4]{81}$ |
| 0.3 = | $\sqrt{0.09}$ | $\sqrt[3]{0.027}$ | $\sqrt[4]{0.0081}$ |

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the index is super
important!!

| How did you do? (Circle one) | Emerging | Developing | Proficient | Extending |
|---------------------------------|----------|------------|------------|-----------|
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Daily Check In

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|--------------------------|--|
| Learning Goal 4.1 | Identify and order irrational numbers. |
|--------------------------|--|



For each number below, write an equivalent form as the table specifies.

| | As a square root | As a cube root | As a fourth root |
|-------|------------------|---|---|
| 2 = | $\sqrt{4}$ | $2 \times 2 \times 2 = 8$ $\sqrt[3]{2^3} \rightarrow 8 \rightarrow \sqrt[3]{8}$ | $2 \times 2 \times 2 \times 2$ $\sqrt[4]{2^4} \rightarrow 16 \rightarrow \sqrt[4]{16}$ |
| 0.2 = | $\sqrt{0.04}$ | $0.2 \times 0.2 \times 0.2$ 0.008 $\sqrt[3]{0.008} \rightarrow \sqrt[3]{0.2^3}$ | $0.2 \times 0.2 \times 0.2 \times 0.2$ $0.04 \quad 0.008$ $\sqrt[4]{0.008} \rightarrow 16$ $\sqrt[4]{0.2^4}$ |

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| | | | | |
|---------------------------------|----------|------------|------------|-----------|
| How did you do? (Circle one) | Emerging | Developing | Proficient | Extending |
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Learning Goal 4.2

Express an entire radical as a simplified mixed radical and vice versa.

Multiple Strategies exist for evaluating radicals.

| $\sqrt[3]{8 \cdot 27} =$ | |
|----------------------------|--|
| Direct (with a calculator) | Indirect (without a calculator) |
| $= 6$ | $\begin{aligned} &\sqrt[3]{8 \times 27} \\ &= \sqrt[3]{8} \times \sqrt[3]{27} \\ &= \sqrt[3]{2^3} \times \sqrt[3]{3^3} = 2 \times 3 = 6 \end{aligned}$ |

| $\sqrt{0.0169} =$ | |
|----------------------------|--|
| Direct (with a calculator) | Indirect (without a calculator) |
| $= 0.13$ | $\begin{aligned} &0.0169 \\ &= \frac{169}{10000} \end{aligned}$ $\begin{aligned} &\sqrt{\frac{169}{10000}} \\ &= \frac{\sqrt{169}}{\sqrt{10000}} \end{aligned}$ $\begin{aligned} &= \frac{\sqrt{13^2}}{\sqrt{100^2}} \\ &= \frac{13}{100} \end{aligned}$ |

Guess which one we're more interested in ... Indirect !!!

Consider

| $\sqrt{24} =$ | |
|----------------------------|--|
| Direct (with a calculator) | Indirect (without a calculator) |
| ≈ 4.9 | $\begin{array}{r} 24 = 2^3 \times 3 \\ \wedge \\ 12 \quad 2 \\ \wedge \\ 6 \quad 2 \\ \wedge \\ 3 \quad 2 \end{array}$ $\begin{aligned} \sqrt{24} &= \sqrt{2^3 \times 3} \\ &= \sqrt{2^2 \times 2 \times 3} \\ &= \sqrt{2^2} \times \sqrt{2} \times \sqrt{3} \\ &= 2 \times \sqrt{2 \times 3} \\ &= 2\sqrt{6} \end{aligned}$ |

This process is going from an entire $\sqrt{24}$ radical to a mixed $2\sqrt{6}$ radical.

Again! Write the radical in simplest form.

$$1. \sqrt{63} = \sqrt{3^2 \times 7}$$

$$\begin{array}{c} \wedge \\ 7 \ 9 \\ \wedge \\ 3 \ 3 \end{array} = 3\sqrt{7}$$

$$2. \sqrt[3]{108} = \sqrt[3]{2^2 \times 3^3}$$

$$\begin{array}{c} \wedge \\ 2 \ 54 \\ \wedge \\ 2 \ 27 \\ \wedge \\ 9 \ 3 \\ \wedge \\ 3 \ 3 \end{array} = 3\sqrt[3]{2^2}$$
~~$$3\sqrt[3]{2^2}$$~~

$$3. \sqrt[4]{128}$$

$$4. \sqrt{30}$$

$$5. \sqrt[3]{32}$$

$$6. \sqrt[4]{48}$$

Hi

Backwards! Write each mixed radical as an entire radical.

$$1. 7\sqrt{3}$$

$$= 7 \times \sqrt{3}$$

$$= \sqrt{49} \times \sqrt{3}$$

$$\rightarrow = \sqrt{7^2 \times 3}$$

$$= \sqrt{3 \times 7^2}$$

$$4. 3\sqrt[3]{5}$$

$$2. 2\sqrt[3]{4}$$

$$= 2 \times \sqrt[3]{4}$$

$$= \sqrt[3]{2^3} \times \sqrt[3]{4}$$

$$= \sqrt[3]{2^3 \times 4}$$

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

$$5. 8\sqrt{2}$$

$$4 = 2^2$$

$$2^3 \times 2^2$$

$$= 2^5$$

$$3. 2\sqrt[5]{3}$$

$$= 2 \times \sqrt[5]{3}$$

$$= \sqrt[5]{2^5} \times \sqrt[5]{3}$$

$$= \sqrt[5]{2^5 \times 3}$$

$$6. 3\sqrt[3]{4}$$