



Warm Up

Tuesday Sept. 27

Write each of the following with only Positive Exponents

$$a) \left(\frac{729}{64} \right)^{-\frac{2}{3}}$$

$$\left(\frac{64}{729} \right)^{\frac{2}{3}}$$

$$\left(\frac{\sqrt[3]{64}}{\sqrt[3]{729}} \right)^2$$

$$= \left(\frac{4}{9} \right)^2$$

$$= \frac{4^2}{9^2}$$

$$= \frac{16}{81}$$

$$b) \frac{(2u^7z^4)^3 y^{-2}}{u^{11}z^{16}}$$

$$= \frac{2^3 u^{21} z^{12} y^{-2}}{u^{11} z^{16}}$$

$$= 8 u^{10} z^{-4} y^{-2}$$

$$= \frac{8 u^{10}}{z^4 y^2}$$

Homework

20 MC

Short Response

- 1/4 1) ab) Entire → Mix
- 1/4 2) ab) Mix → Entire
- 1/8 3) abcdef Simplifi

Test Review
 Page 246-248
 Questions

3,6,7,11,12,14,17,18,19,

Stop

42 pts

TOMORROW →



3. Estimate the value of each radical to 1 decimal place. What strategies can you use?

a) $\sqrt{11}$ b) $\sqrt[3]{-12}$ c) $\sqrt[4]{15}$

\swarrow \searrow $\sqrt[3]{8}$ $\sqrt[3]{27}$
 $\sqrt{9}$ $\sqrt{16}$ \downarrow \downarrow
3 4 -2 -3

≈ 3.2 ≈ -2.2

6. Tell whether each number is rational or irrational. Justify your answers.

Stop or Repeats

don't stop

a) -2 \mathbb{R} b) 17 \mathbb{R} c) $\sqrt{16} = 4$ \mathbb{R}
d) $\sqrt{32} \Rightarrow \mathbb{I}$ e) 0.756 \mathbb{R} f) $12.\bar{3}$ \mathbb{R}
g) 0 \mathbb{R} h) $\sqrt[3]{81}$ \mathbb{I} i) π \mathbb{I}

7. Determine the approximate side length of a square with area 23 cm^2 . How could you check your answer?

$$\begin{aligned} \text{side} &= \sqrt{\text{area}} \\ &= \sqrt{23} \\ &\quad \swarrow \quad \searrow \\ &\sqrt{16} \quad \sqrt{25} \\ &4 \quad \quad 5 \\ &\quad \quad \quad \approx 4.8 \end{aligned}$$

12. Write each mixed radical as an entire radical.

a) $6\sqrt{5}$

b) $3\sqrt{14}$

c) $4\sqrt[3]{3}$

d) $2\sqrt[4]{2}$

$$\begin{aligned} \text{a) } & \sqrt{6^2 \times 5} \\ & = \sqrt{36 \times 5} \\ & = \sqrt{180} \end{aligned}$$

$$\begin{aligned} \text{b) } & \sqrt{3^2 \times 14} \\ & = \sqrt{9 \times 14} \\ & = \sqrt{126} \end{aligned}$$

$$\begin{aligned} \text{c) } & 4\sqrt[3]{3} \\ & = \sqrt[3]{4^3 \times 3} \\ & = \sqrt[3]{64 \times 3} \\ & = \sqrt[3]{212} \end{aligned}$$

$$\begin{aligned} \text{d) } & 2\sqrt[4]{2} \\ & = \sqrt[4]{2^4 \times 2} \\ & = \sqrt[4]{16 \times 2} \\ & = \sqrt[4]{32} \end{aligned}$$

14. A student simplified $\sqrt{300}$ as shown:

$$\begin{aligned}\sqrt{300} &= \sqrt{3} \cdot \sqrt{100} \\ &= \sqrt{3} \cdot \sqrt{50} \cdot \sqrt{50} \\ &= \sqrt{3} \cdot \sqrt{2} \cdot \sqrt{25} \cdot \sqrt{2} \cdot \sqrt{25} \\ &= 3 \cdot 5 \cdot \sqrt{2} \cdot 5 \\ &= 75\sqrt{2}\end{aligned}$$

$$\begin{array}{c}\sqrt{300} \\ \swarrow \quad \searrow \\ \sqrt{100} \quad \sqrt{3} \\ 10 \quad \sqrt{3}\end{array}$$

Identify the errors the student made, then write a correct solution.

17. Express each power as a radical.

a) $12^{\frac{1}{4}}$

b) $(-50)^{\frac{5}{3}}$

c) $1.2^{0.5}$

d) $\left(\frac{3}{8}\right)^{\frac{1}{3}}$

a) $\sqrt[4]{12}$

b) $\left(\sqrt[3]{-50}\right)^5$

or

c) $1.2^{0.5}$
 $1.2^{\frac{1}{2}}$

$\sqrt[3]{-50^5}$

$\sqrt{1.2}$

d) $\left(\frac{3}{8}\right)^{\frac{1}{3}}$

$\sqrt[3]{\frac{3}{8}}$

$\frac{\sqrt[3]{3}}{\sqrt[3]{8}}$

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

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

2

18. Express each radical as a power.

a) $\sqrt{1.4} = 1.4^{\frac{1}{2}}$ b) $\sqrt[3]{13^2} = 13^{\frac{2}{3}}$

c) $(\sqrt[5]{2.5})^4 = 2.5^{\frac{4}{5}}$ d) $\left(\frac{\sqrt[4]{2}}{\sqrt{5}}\right)^3 = \left(\frac{2}{5}\right)^{\frac{3}{4}}$

19. Evaluate each power without using a calculator.

a) $16^{0.25}$

b) $1.44^{\frac{1}{2}}$

c) $(-8)^{\frac{5}{3}}$

d) $\left(\frac{9}{16}\right)^{\frac{3}{2}}$

$$\begin{aligned} \text{a) } 16^{0.25} &= 16^{\frac{1}{4}} \\ &= \sqrt[4]{16} \\ &= 2 \end{aligned}$$

$$\begin{aligned} \text{b) } 1.44^{\frac{1}{2}} &= \sqrt{1.44} \\ &= 1.2 \end{aligned} \quad \frac{\sqrt{144}}{\sqrt{100}} = \frac{12}{10} = 1.2$$

$$\begin{aligned} \text{c) } (-8)^{\frac{5}{3}} &= \left(\sqrt[3]{-8}\right)^5 \\ &= (-2)^5 \\ &= -32 \end{aligned}$$

$$\begin{aligned} \text{d) } \left(\frac{9}{16}\right)^{\frac{3}{2}} &= \left(\frac{\sqrt{9}}{\sqrt{16}}\right)^3 \\ &= \left(\frac{3}{4}\right)^3 \\ &= \frac{3^3}{4^3} \\ &= \frac{27}{64} \end{aligned}$$

Homework

20 MC
Short Response

Test Review
Page 246-248
Questions

1/4 1) ab) Entin → Mix
1/4 2) ab) Mix → Entin
1/8 3) abcd) Simplifi



42 pts

22,24,25,28,29,30,32

PLUS SHEET for practice



- 22.** Kleiber's law relates a mammal's metabolic rate while resting, q Calories per day, to its body mass, M kilograms:

$$q = 70M^{\frac{3}{4}}$$

What is the approximate metabolic rate of each animal?

- a) a cow with mass 475 kg
 - b) a mouse with mass 25 g
-

24. Evaluate each power without using a calculator.

a) 2^{-2} b) $\left(\frac{2}{3}\right)^{-3}$ c) $\left(\frac{4}{25}\right)^{-\frac{3}{2}}$

- 25.** Kyle wants to have \$1000 in 3 years. He uses this formula to calculate how much he should invest today in a savings account that pays 3.25% compounded annually: $P = 1000(1.0325)^{-3}$
How much should Kyle invest today?

28. Simplify. Explain your reasoning.

a) $(3m^4n)^2$ b) $\left(\frac{x^2y}{y^{-2}}\right)^{-2}$

c) $(16a^2b^6)^{-\frac{1}{2}}$ d) $\left(\frac{r^3s^{-1}}{s^{-2}r^{-2}}\right)^{-\frac{2}{3}}$

29. Simplify. Show your work.

a) $(a^3b)(a^{-1}b^4)$ b) $\left(x^{\frac{1}{2}}y\right)\left(x^{\frac{3}{2}}y^{-2}\right)$

c) $\frac{a^3}{a^5} \cdot a^{-3}$ d) $\frac{x^2y}{x^{\frac{1}{2}}y^{-2}}$

30. Evaluate.

a) $\left(\frac{3}{2}\right)^{\frac{3}{2}} \cdot \left(\frac{3}{2}\right)^{\frac{1}{2}}$

b) $\frac{(-5.5)^{\frac{2}{3}}}{(-5.5)^{-\frac{4}{3}}}$

c) $\left[\left(-\frac{12}{5}\right)^{\frac{1}{3}}\right]^6$

d) $\frac{0.16^{\frac{3}{4}}}{0.16^{\frac{1}{4}}}$

Assignment

Date _____

Simplify. Your answer should contain only positive exponents.

1) $\frac{2u^3v^3 \cdot (3u^2)^2}{2u^2}$

2) $\frac{(4xy^2)^3}{(4y^3)^4 \cdot 2y^3}$

3) $\frac{(4uv^2)^2}{3u^2v^4 \cdot 3v^2}$

4) $\left(\frac{4a^4b^3}{3a^4b^3 \cdot 4a^3b^4}\right)^3$

5) $\left(\frac{3y^3 \cdot 3x^3y^4}{4x^4y^2}\right)^4$

6) $\left(\frac{3xy^4 \cdot 3x^3y^2}{yx^4}\right)^3$

7) $\frac{2ba^2}{4a(2a^3b^4)^3}$

8) $\frac{(2x^2y^2)^4}{(2x^2 \cdot (yx^2)^3)^2}$

9) $\frac{(m^2n^2)^2}{3m^4n^2 \cdot 2m^3n^2}$

10) $\frac{x^2}{4x^4y^2 \cdot (3x^4y^2)^2}$

11) $\left(\frac{n}{m \cdot 2m^4n^4}\right)^4$

12) $\left(\frac{3x^2y^3 \cdot 4x^3y^2}{3xy^3}\right)^4$

13) $\left(\frac{3x^2y^4 \cdot x^3y^3}{(2x^2y^3)^4}\right)^2$

14) $\left(\frac{2u^4v^3 \cdot 2uv^3}{4u^3}\right)^4$

15) $\frac{3uv^2}{2u^3v^2 \cdot (2v^2)^2}$

16) $\frac{(4y)^3}{4y \cdot 3y^2}$

Answers to Assignment (ID: 1)

4) $\frac{1}{27a^9b^{12}}$
 8) $\frac{4y^2}{x^8}$
 12) $256x^{16}y^8$
 16) $\frac{16}{3}$

3) $\frac{16}{9v^2}$
 7) $\frac{1}{16a^8b^{11}}$
 11) $\frac{1}{16m^{20}n^{12}}$
 15) $\frac{3}{8u^2v^4}$

2) $\frac{x^3}{8y^9}$
 6) $729y^{15}$
 10) $\frac{1}{36x^{10}y^6}$
 14) u^8y^{24}

1) $9u^5v^3$
 5) $\frac{6561y^{20}}{256x^4}$
 9) $\frac{1}{6m^3}$
 13) $\frac{9}{256x^6y^{10}}$

Assignment

Date _____

Simplify. Your answer should contain only positive exponents.

1) $k^3 \cdot 8k^3$

2) $7x^3 \cdot 8x^2$

3) $8x^2 \cdot 8x^2$

4) $6n \cdot 8n^3$

5) $4k^3 \cdot 8k^3$

6) $\frac{5x^4}{8x}$

7) $\frac{8n^3}{5n}$

8) $\frac{2b^4}{b^3}$

9) $\frac{3v^2}{6v^3}$

10) $\frac{5x^4}{2x^4}$

11) $\frac{x^3}{2x^2 \cdot 5x}$

12) $\frac{2p^2 \cdot 5p^3}{6p}$

13) $\frac{4n^3 \cdot 3n^2}{6n}$

14) $\frac{6m^2}{3m^2 \cdot 6m}$

15) $\frac{2r}{4r^2 \cdot 5r^2}$

16) $(2x^4)^2$

17) $(3a)^2$

18) $(5k^4)^3$

19) $(3p)^4$

20) $(3n)^3$

4) $48n^4$
8) $2b$
12) $\frac{5p^4}{3}$
16) $4x^8$
20) $27n^3$

Answers to Assignment (ID: 1)

3) $64x^4$
7) $\frac{8n^2}{5}$
11) $\frac{1}{10}$
15) $\frac{1}{10v^3}$
19) $81p^4$

2) $56x^5$
6) $\frac{5x^3}{8}$
10) $\frac{5}{2}$
14) $\frac{1}{3m}$
18) $125k^{12}$

1) $8k^6$
5) $32k^6$
9) $\frac{1}{2v}$
13) $2n^4$
17) $9a^2$

