MUST SHOW STEPS WHENEVER APPROPRIATE

$\frac{49}{*7}$
$\overline{343}$

Classify each number as one or more of the following: natural number, whole number, integer, rational number, irrational number, or real number.

1) $\frac{53}{76}$ (Fraction of 9– to 10– year–old children at a day camp)

Rational

2) 834 (Number of students in the school)

Whole, Natural, Integer, Rational

3) $70\sqrt{7}$ (Length in feet of the playground)

IRRATIONAL

State whether the equation is the result of an identity, commutative, associative, or distributive property.

4) $-(2x + 8y) = -2x - 8y$

Distributive

5) $(4 \cdot 3) \cdot 5 = 4 \cdot (3 \cdot 5)$

Associative

6) $3 + 2 = 2 + 3$

Commutative

Write the number as an exponential expression using the given base.

7) $\frac{1}{243}$ (base 3) $= 3^{-5}$

$\frac{81}{3}$
$\frac{243}{*3}$
$\overline{729}$

Evaluate the expression.

8) $-5^4 = -5^{\wedge}4 = -625$

9) $\left(\frac{5}{6}\right)^{-2} = \left(\frac{6}{5}\right)^2 = \frac{36}{25}$

10) $3^{-2} = \frac{1}{9}$

11) $\frac{1}{7^{-3}} = 7^3 = 343$

Use properties of exponents to simplify. Write answers with positive exponents.

12) $x^{-7} \cdot x^4 \cdot x^{-3} = x^{-7+4+-3} = x^{-6} = \frac{1}{x^6}$

13) $4a^9 \cdot 2a^{-3} = 8a^6$

14) $\frac{3^{-2}}{3^4} = 3^{-2-4} = 3^{-6} = \frac{1}{3^6} = \frac{1}{729}$

15) $\frac{4^{-5}}{4^{-3}} = 4^{-5--3} = 4^{-2} = \frac{1}{16}$

16) $(5x^4)^{-3} = 5^{-3}x^{-12} = \frac{1}{125x^{12}}$

17) $\frac{12x^{-4}y^7}{6x^5} = 2x^{-4-5}y^7 = \frac{2y^7}{x^9}$

18) $\left(\frac{5x}{y^3}\right)^{-4} = \frac{y^{12}}{(5x)^4} = \frac{y^{12}}{625x^4}$

19) $\left(\frac{-3x}{y^4}\right)^{-3} = \left(\frac{y^4}{-3x}\right)^{+3} = \frac{y^{12}}{-27x^3}$

Use properties of exponents to simplify. Write answers with positive exponents.. Assume variables represent nonnegative numbers.

20) $\dfrac{7^3 m \cdot 7^6 m}{7^{-7} m} = \dfrac{7^9 m}{7^{-7}}$

$= 7^{16} m$

21) $\dfrac{8^{-6}p \cdot 8^{-8}p}{8^7 p^3} = \dfrac{8^{-14} p^{-1}}{8^7}$

$= 8^{-14-7} p^{-1} = 8^{-21} p^{-1} = \dfrac{1}{8^{21} p}$

22) $\dfrac{x^{-7}}{(8x)^{-7}} = \dfrac{(8x)^7}{x^7} = 8^7 x^0$

$= 8^7 = 2097152$

23) $\dfrac{(6x)^9}{x^9} = \dfrac{6^9 x^9}{x^9} = 6^9 = 10077696$

24) $\dfrac{x^{-2}(x^9)^{-2}}{(x^{-5})^{-5}} = \dfrac{x^{-2} x^{-18}}{x^{25}} = \dfrac{x^{-20}}{x^{25}} = x^{-20-25}$

$= x^{-45} = \dfrac{1}{x^{45}}$

Evaluate each expression following the order of operations.

25) $\dfrac{4^3 - 34}{8} + \dfrac{3}{4} = -1.375$

26) $\dfrac{-5^2 + 1}{\frac{2}{5}} = -60$

Write the number in scientific notation.

27) 76,197 $= 7.6197 \times 10^4$

28) 0.00001094 $= 1.094 \times 10^{-5}$

29) Convert 8.672×10^7 to standard form

8672 0000

30) Convert 7.0262×10^{-7} to standard form

0.000 00070262

31) If P dollars is deposited in a savings account paying r% annual interest, then the amount A in the account after x years is given by $A = P(1 + \dfrac{r}{100})^x$. Find A if P = $300, x = 5 years, and r = 3%.

$A = 300(1 + \dfrac{3}{100})^5 = \$347.78$

32) In a certain year the Federal debt held by the public was $1.47 trillion, while the population of the United States was 326 million. Approximate the national debt per person.

$(1.47 \times 10^{12}) \div (326 \times 10^6) = \$4509.20$

33) A movie opened with a first day attendance of 1,200,000. If the average cost of a ticket was $8, how much was collected from ticket sales on the first day?

1200000 × 8 = \$9600000

Evaluate the expression and write the answer in standard form.

34) $\dfrac{(4 \times 10^{-4})}{(8 \times 10^{-3})} = 0.05$