NAME ANSWERS DATE PERIOD

Lesson 2 Homework Practice

Negative Exponents

Write each expression using a positive exponent.

1. 7^{-8} $\frac{1}{7^8}$

2. 10^{-6} $\frac{1}{10^6}$

3. 23^{-1} $\frac{1}{23^1}$ or $\frac{1}{23}$

4. $(-5)^{-2}$ $\frac{1}{(-5)^2}$

5. $(-18)^{-10}$ $\frac{1}{(-18)^{10}}$

6. m^{-99} $\frac{1}{m^{99}}$

7. $(-1)^{-12}$ $\frac{1}{(-1)^{12}}$

8. c^{-6} $\frac{1}{c^6}$

9. p^{-5} $\frac{1}{p^5}$

10. g^{-17} $\frac{1}{g^{17}}$

11. z^{-4} $\frac{1}{z^4}$

12. t^{-2} $\frac{1}{t^2}$

Write each fraction as an expression using a negative exponent other than -1.

13. $\frac{1}{2^{10}}$ 2^{-10}

14. $\frac{1}{29^3}$ 29^{-3}

15. $\frac{1}{4^4}$ 4^{-4}

16. $\frac{1}{39}$ 39^{-1}

17. $\frac{1}{81^7}$ 81^{-7}

18. $\frac{1}{m^4}$ m^{-4}

19. $\frac{1}{x^3}$ x^{-3}

20. $\frac{1}{a^2}$ a^{-2}

21. $\frac{1}{49}$ 7^{-2}

22. $\frac{1}{8}$ 2^{-3}

23. $\frac{1}{144}$ 12^{-2}

24. $\frac{1}{169}$ 13^{-2}

Evaluate each expression if $x = 3$, $y = -2$, and $z = 4$.

25. x^{-4} $\frac{1}{81}$

26. y^{-2} $\frac{1}{4}$

27. y^{-5} $-\frac{1}{32}$

28. z^{-4} $\frac{1}{256}$

29. 5^y $\frac{1}{25}$

30. 10^y $\frac{1}{100}$

31. $3z^{-1}$ $\frac{3}{4}$

32. z^y $\frac{1}{16}$

33. $(xz)^{-2}$ $\frac{1}{144}$

34. Hair grows at a rate of $\frac{1}{64}$ inch per day. Write this number using negative exponents.
8^{-2} or 4^{-3} or 2^{-6}

Lesson 2 Problem-Solving Practice

Negative Exponents

1. The distance between Earth and the Sun is about $\frac{1}{100,000}$ the diameter of the solar system. Express this number using a negative exponent other than -1. **10^{-5}**

2. The paper used by the students at Hopkins Middle School is approximately $\frac{1}{216}$ inch thick. Express this number using a negative exponent other than -1. **6^{-3}**

3. A microsecond is a measure of time that is equal to one millionth of a second. Express this number as a power of 10 with a negative exponent.

10^{-6}

4. There are 10^{-2} meters in 1 centimeter. At the site of an automobile accident, a state trooper uses a measuring tape to determine that the width of a tire track has a length of 20 centimeters. Express this number as a fraction of a meter in simplest form.

$\frac{20}{100} = \frac{1}{5}$ m

5. Libby computed 2^{-3} by writing the following equation.

$$2^{-3} = -8$$

What was Libby's error? Explain. Then give the correct answer. **$2^{-3} = \frac{1}{8}$**

Sample answer: Libby took the opposite of 2^3 instead of taking the reciprocal of 2^3.

6. The table below shows the mass of four common insects.

Insect	Mass (g)
honeybee	8^{-2}
ant	16^{-2}
housefly	9^{-2}
moth	4^{-2}

Express each mass using a positive exponent. Then determine which insect has the greatest mass.

honeybee: $\frac{1}{8^2}$ or $\frac{1}{64}$; ant: $\frac{1}{16^2}$ or $\frac{1}{256}$; housefly: $\frac{1}{9^2}$ or $\frac{1}{81}$; moth: $\frac{1}{4^2}$ or $\frac{1}{16}$; The moth has the greatest mass.