Lesson 1.3 Negative Exponents

When a power includes a negative exponent, express the number as 1 divided by the base and change the exponent to positive.

$$4^{-2} = \frac{1}{4^2}$$
$$= \frac{1}{16}$$
$$= 0.0625$$

To multiply or divide powers with the same base, combine bases, add or subtract the exponents, and then simplify.

$$2^{-3} \times 2^{-2} = 2^{-5} = \frac{1}{2^5} = 0.03125$$
$$2^{-4} \div 2^{-2} = 2^{-2} = \frac{1}{2^2} = 0.25$$

Rewrite each expression with a positive exponent. Then, solve.
Round your answer to four decimal places.

	a	**b**	**c**
1.	$3^{-2} =$ _____	$6^{-3} =$ _____	$8^{-2} =$ _____
2.	$7^{-3} =$ _____	$3^{-3} =$ _____	$9^{-2} =$ _____
3.	$4^{-3} =$ _____	$5^{-2} =$ _____	$2^{-3} =$ _____
4.	$2^{-4} =$ _____	$10^{-3} =$ _____	$1^{-4} =$ _____

Find each product. Round your answer to five decimal places.

5. $4^{-2} \times 4^{-3} =$ _____	$2^{-4} \times 2^{-1} =$ _____	$3^{-2} \times 3^{-3} =$ _____
6. $6^{-2} \times 6^{-2} =$ _____	$5^{-2} \times 5^{-4} =$ _____	$3^{-2} \times 3^{-2} =$ _____
7. $8^{-6} \times 8^{4} =$ _____	$7^{-5} \times 7^{2} =$ _____	$2^{-7} \times 2^{4} =$ _____

Find each quotient. Round your answer to five decimal places.

8. $4^{-4} \div 4^{-2} =$ _____	$8^{-5} \div 8^{-3} =$ _____	$3^{-5} \div 3^{-2} =$ _____
9. $2^{-8} \div 2^{-4} =$ _____	$5^{-6} \div 5^{-4} =$ _____	$6^{-7} \div 6^{-4} =$ _____
10. $3^{-3} \div 3^{2} =$ _____	$4^{-3} \div 4^{1} =$ _____	$2^{-6} \div 2^{-3} =$ _____