

Grade 8 · Properties of Integer Exponents · Test Answer Key

Common Core 8.EE.A.1 · mathovore.fr

Use this key to score the test out of 20 points. Each solution shows the expected exponent steps, and the scoring note explains how points are awarded. Give partial credit for a correct method with one arithmetic slip.

Grade 8 Common Core: 8.EE.A.1

Question 1: Evaluate powers (2 points)

a. $5^3 = 5 \cdot 5 \cdot 5 = 125$

b. $10^{-3} = \frac{1}{10^3} = \frac{1}{1000}$

Scoring: 1 point per part.

Question 2: Positive exponent rules (3 points)

a. $4+7=11$, so 6^{11}

b. $12-5=7$, so 9^7

c. $5 \cdot 3 = 15$, so 2^{15}

Scoring: 1 point per part for the correct power.

Question 3: Negative exponent rules (3 points)

a. $-4+9=5$, so 3^5

b. $2-6=-4$, so $7^{-4} = \frac{1}{7^4}$

c. $(-2)(-3)=6$, so 5^6

Scoring: 1 point per part.

Question 4: Show an equivalent expression (2 points)

Add exponents: $6+(-9)=-3$, so the product is 2^{-3} . Then $2^{-3} = \frac{1}{2^3} = \frac{1}{8}$. The expressions are equal.

Scoring: 1 point for adding the exponents correctly, 1 point for converting to the fraction.

Question 5: Zero and fraction bases (2 points)

- a. $(-9)^0 = 1$
b. $\left(\frac{1}{2}\right)^{-3} = 2^3 = 8$

Scoring: 1 point per part.

Question 6: Complete the table (2 points)

- a. The values are 1, $\frac{1}{3}$ and $\frac{1}{9}$.
b. $3^{-4} = \frac{1}{3^4} = \frac{1}{81}$

	÷ 3	÷ 3	÷ 3	÷ 3	÷ 3
3³	3²	3¹	3⁰	3⁻¹	3⁻²
27	9	3	1	1/3	1/9

Divide by 3 each step.

Scoring: (a) 1 point for all three values. (b) 1 point.

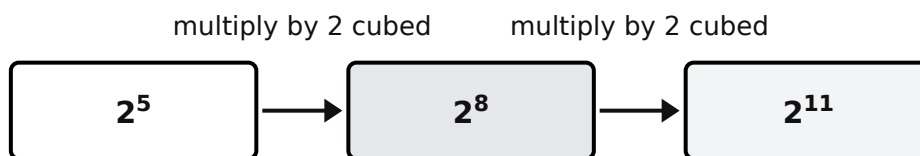
Question 7: Multi-step simplify (2 points)

Inside: $3 + (-5) = -2$, so 4^{-2} . Power: $(4^{-2})^2 = 4^{-4}$. Divide: $-4 - (-2) = -2$, so $4^{-2} = \frac{1}{16}$.

Scoring: 1 point for simplifying the parentheses and power, 1 point for the quotient and the fraction.

Question 8: Colony growth (2 points)

After 1 hour: $2^5 \cdot 2^3 = 2^8$, which is **256**. After 2 hours: $2^8 \cdot 2^3 = 2^{11}$.



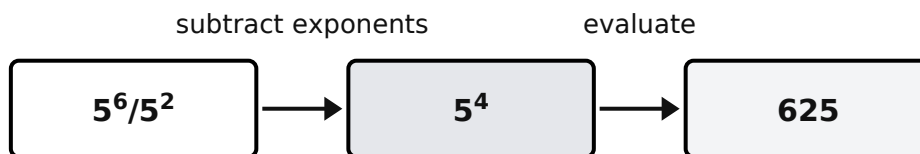
Add 3 to the exponent each hour.

Scoring: 1 point for 2 to the 8th with 256, 1 point for 2 to the 11th.

Question 9: Find the error (2 points)

She divided the exponents, but the quotient rule subtracts them: $6 - 2 = 4$. The correct result is

$$5^4 = 625.$$



Corrected work.

Scoring: 1 point for identifying the error, 1 point for the correct value.

Total
20 points