Summative Assessment
Common Core Standards:
8.EE.1: Know and apply the properties of integer exponents to generate equivalent numerical expressions.

8.EE.3: Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.

8.EE.4: Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities. Interpret scientific notation that has been generated by technology.

Calculations

Total

Unit 2 Part 1 Exponents
Summative Assessment Pre-Test & Study Guide
NO CALCULATOR

Simplify the following expressions. All answers must have positive exponents. (8.EE.1)

1. \( 5^{-8} \times 5^4 \)
   \[ 5^{-8} \times 5^4 = \frac{1}{5^4} \]

2. \( \frac{2^6}{3^3} \)
   \[ \frac{2^6}{3^3} = 3^3 \]

3. \( (2x^3)^{-3} \)
   \[ 2^{-3} x^{-4} = \frac{1}{2^3 x^4} \]

4. \( (n^7 \times n^2)^4 \)
   \[ n^8 \times n^8 = n^{34} \]
Determine whether the following statements are true or not and explain in words how you know. (8.EE.1)

5. \( \frac{a^{12}}{q} = (q^{-1})^3 \)
   \[ \downarrow \] \[ \downarrow \]
   9 \( \neq 9^{11} \)
   No b/c they are not the same

6. \( \frac{r^5}{r^2} \)
   \[ \downarrow \] \[ \downarrow \]
   \( r^2 \neq r^{-2} \)
   No b/c they are not the same

Solve the following expressions. All answers must have positive exponents. Show work. (8.EE.1)

7. \( (3x^2y)^4 \times (4x^3y)^3 \)
   \[ \downarrow \] \[ \downarrow \]
   \[ 3x^8 \times 4^3 x^{12} \]
   \[ \rightarrow \]
   \[ 81 \times 64 x^{18} \]
   \[ \downarrow \]
   \[ 5184 x^{20} \]

8. \( \frac{5x^4y^8}{20x^2y^2} \)
   \[ \downarrow \]
   \[ \frac{1 \times x^2 y^4}{4} \]
   \[ \frac{5}{20} \times \frac{1}{y^2} = \frac{1}{4} \]
   or
   \[ \frac{x^2 y^4}{4} \]

9. \( 5^0 = 1 \)
Solve for the missing variable. Show work - must be algebraic equations. (8.EE.1)

10. \((v^2)^3 = (v^4)^2\)
   \[
   \sqrt[12]{v^2}
   \]
   \[v = 3\]

11. \(\frac{x^5}{x^3} = \frac{1}{x^4}\)
   \[
   \frac{8}{x} + \frac{-4}{x} = \frac{-9}{x}
   \]
   \[x = 9, x = -9\]

Solve the following questions. (8.EE.3)

12. The company Google is worth approximately \(7 \times 10^9\) dollars. The company Smith Avenue Donut is worth approximately \(3 \times 10^8\) dollars. How many times bigger is Google's worth than Smith Avenue Donut's worth?
   \[
   \frac{7 \times 10^9}{3 \times 10^8} = 2.3 \times 10^4
   \]

13. The mass of Earth is about \(6 \times 10^{24}\) and the mass of Jupiter is about \(2 \times 10^{27}\). About how many times bigger is Jupiter than Earth?
   \[
   \frac{2 \times 10^{27}}{6 \times 10^{24}} = 3.3 \times 10^2
   \]

14. Francisco was converting the number \(640000000000\) to scientific notation and got \(6.4 \times 10^{10}\). Is he correct? Explain your reasoning.
   No because it should be \(6.4 \times 10^9\)

15. Ghalia was converting the number \(7.1 \times 10^5\) to decimal (standard form) and got \(0.0000071\). Is she correct? Explain your reasoning.
   No because there are only -5 places and there should be -6.
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Calculations

Total

**Unit 2 Part 1 Exponents**

**Pre-Test & Study Guide**

**CALCULATOR ALLOWED**

For questions 1-4, write the final answer in scientific notation. Show work. (8.EE.4)

1. \((7.4 \times 10^4) + (3.1 \times 10^3) = \) 
   
   \(7.71 \times 10^4\)

2. \((7.4 \times 10^4) - (3.1 \times 10^3) = \) 
   
   \(7.09 \times 10^4\)

3. \((7.4 \times 10^4) \times (3.1 \times 10^3) = \) 
   
   \(2.294 \times 10^8\)

4. \(\frac{(7.4 \times 10^4)}{(3.1 \times 10^3)} = \) 
   
   \(2.387094774 \times 10^1\)