

Name: \_\_\_\_\_

Score: \_\_\_\_\_

**Quotient Rule**

Use quotient rule and rewrite each expression as single exponent.

1)  $\left(\frac{5}{9}\right)^{-3} \div \left(\frac{5}{9}\right)^{-9}$

2)  $\frac{\left(\frac{2}{7}\right)^{-3}}{\left(\frac{2}{7}\right)^{-2}} \div \left(\frac{2}{7}\right)^{-8}$

3)  $\frac{(-4)^{-6}}{(-4)^3} \div \frac{(-4)^{-12}}{(-4)^{-5}}$

4)  $\frac{\left(\frac{3}{4}\right)^{12}}{\left(\frac{3}{4}\right)^6} \div \frac{\left(\frac{3}{4}\right)^7}{\left(\frac{3}{4}\right)^{-2}}$

5)  $(-9)^{-8} \div (-9)^{-17}$

6)  $\left(-\frac{3}{8}\right)^{20} \div \left(-\frac{3}{8}\right)^{11}$

7)  $\frac{8^{-9}}{8^{-13}} \div \frac{8^7}{8^3}$

8)  $\frac{(-7)^{-13}}{(-7)^{11}} \div (-7)^{-19}$

9)  $(-15)^9 \div (-15)^{-7}$

10)  $\frac{\left(\frac{6}{7}\right)^{19}}{\left(\frac{6}{7}\right)^{-6}} \div \frac{\left(\frac{6}{7}\right)^{12}}{\left(\frac{6}{7}\right)^4}$

11)  $12^{-18} \div 12^{-5}$

12)  $\frac{11^3}{11^5} \div 11^{-6}$

13)  $\left(\frac{1}{8}\right)^9 \div \left(\frac{1}{8}\right)^{-12}$

14)  $\frac{\left(\frac{3}{5}\right)^{11}}{\left(\frac{3}{5}\right)^{-2}} \div \left(\frac{3}{5}\right)^{-6}$

15)  $19^{-17} \div 19^{-7}$

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**Answers**

1)  $\left(\frac{5}{9}\right)^{-3} \div \left(\frac{5}{9}\right)^{-9}$   
 $= \left(\frac{5}{9}\right)^6$

2)  $\frac{\left(\frac{2}{7}\right)^{-3}}{\left(\frac{2}{7}\right)^{-2}} \div \left(\frac{2}{7}\right)^{-8}$   
 $= \left(\frac{2}{7}\right)^7$

3)  $\frac{(-4)^{-6}}{(-4)^3} \div \frac{(-4)^{-12}}{(-4)^{-5}}$   
 $= (-4)^{-2}$

4)  $\frac{\left(\frac{3}{4}\right)^{12}}{\left(\frac{3}{4}\right)^6} \div \frac{\left(\frac{3}{4}\right)^7}{\left(\frac{3}{4}\right)^{-2}}$   
 $= \left(\frac{3}{4}\right)^{-3}$

5)  $(-9)^{-8} \div (-9)^{-17}$   
 $= (-9)^9$

6)  $\left(-\frac{3}{8}\right)^{20} \div \left(-\frac{3}{8}\right)^{11}$   
 $= \left(-\frac{3}{8}\right)^9$

7)  $\frac{8^{-9}}{8^{-13}} \div \frac{8^7}{8^3}$   
 $= 1$

8)  $\frac{(-7)^{-13}}{(-7)^{11}} \div (-7)^{-19}$   
 $= (-7)^{-5}$

9)  $(-15)^9 \div (-15)^{-7}$   
 $= (-15)^{16}$

10)  $\frac{\left(\frac{6}{7}\right)^{19}}{\left(\frac{6}{7}\right)^{-6}} \div \frac{\left(\frac{6}{7}\right)^{12}}{\left(\frac{6}{7}\right)^4}$   
 $= \left(\frac{6}{7}\right)^{17}$

11)  $12^{-18} \div 12^{-5}$   
 $= 12^{-13}$

12)  $\frac{11^3}{11^5} \div 11^{-6}$   
 $= 11^4$

13)  $\left(\frac{1}{8}\right)^9 \div \left(\frac{1}{8}\right)^{-12}$   
 $= \left(\frac{1}{8}\right)^{21}$

14)  $\frac{\left(\frac{3}{5}\right)^{11}}{\left(\frac{3}{5}\right)^{-2}} \div \left(\frac{3}{5}\right)^{-6}$   
 $= \left(\frac{3}{5}\right)^{19}$

15)  $19^{-17} \div 19^{-7}$   
 $= 19^{-10}$