Name _____   Date _____

Challenge Practice
For use with the lesson "Write and Graph Exponential Decay Functions"

In Exercises 1–5, find an exponential function of the form $f(x) = ab^x$ that passes through the given points.

1. $\left(1, \dfrac{3}{2}\right), \left(2, \dfrac{3}{4}\right), \left(4, \dfrac{3}{16}\right)$

2. $\left(1, \dfrac{2}{3}\right), \left(3, \dfrac{2}{27}\right), \left(5, \dfrac{2}{243}\right)$

3. $(0, 4), \left(2, \dfrac{36}{25}\right), \left(3, \dfrac{108}{125}\right)$

4. $(1, 1), \left(2, \dfrac{2}{5}\right), \left(3, \dfrac{4}{25}\right)$

5. $\left(0, \dfrac{7}{3}\right), (1, 1), \left(2, \dfrac{3}{7}\right)$

In Exercises 6–9, use the properties of exponents to write both functions so that each has the same constant raised to a power, then determine which function has the greater value when $x = 1$.

6. $f(x) = 3 \cdot \left(\dfrac{1}{9}\right)^{5x}$

$g(x) = 4 \cdot \left(\dfrac{1}{3}\right)^{6x}$

7. $f(x) = 2 \cdot \left(\dfrac{1}{4}\right)^{2x-1}$

$g(x) = 5 \cdot \left(\dfrac{1}{16}\right)^{x+2}$

8. $f(x) = \left(\dfrac{1}{5}\right)^{x+1}$

$g(x) = \left(\dfrac{1}{25}\right)^{2x}$

9. $f(x) = 6 \cdot \left(\dfrac{3}{4}\right)^{2x}$

$g(x) = \dfrac{1}{2} \cdot \left(\dfrac{18}{32}\right)^{x}$