38. **★ MULTIPLE CHOICE** What is $g(f(x))$ if $f(x) = 7x^2$ and $g(x) = 3x^{-2}$?

    Ⓐ $\dfrac{3}{49x^4}$ Ⓑ 21 Ⓒ $21x^4$ Ⓓ $\dfrac{7}{9x^4}$

39. **★ OPEN-ENDED MATH** Find two different functions f and g such that $f(g(x)) = g(f(x))$.

CHALLENGE Find functions f and g such that $f(g(x)) = h(x)$, $g(x) \neq x$, and $f(x) \neq x$.

40. $h(x) = \sqrt[3]{x + 2}$ 41. $h(x) = \dfrac{4}{3x^2 + 7}$ 42. $h(x) = |2x + 9|$

PROBLEM SOLVING

43. **BIOLOGY** For a mammal that weighs w grams, the volume b (in milliliters) of air breathed in and the volume d (in milliliters) of "dead space" (the portion of the lungs not filled with air) can be modeled by:

$$b(w) = 0.007w \qquad\qquad d(w) = 0.002w$$

The breathing rate r (in breaths per minute) of a mammal that weighs w grams can be modeled by:

$$r(w) = \dfrac{1.1w^{0.734}}{b(w) - d(w)}$$

Simplify $r(w)$ and calculate the breathing rate for body weights of 6.5 grams, 300 grams, and 70,000 grams.

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44. **★ SHORT RESPONSE** The cost (in dollars) of producing x sneakers in a factory is given by $C(x) = 60x + 750$. The number of sneakers produced in t hours is given by $x(t) = 50t$. Find $C(x(t))$. Evaluate $C(x(5))$ and explain what this number represents.

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45. **MULTI-STEP PROBLEM** An online movie store is having a sale. You decide to open a charge account and buy four DVDs.

   a. Use composition of functions to find the sale price of $85 worth of DVDs when the $15 discount is applied before the 10% discount.

   b. Use composition of functions to find the sale price of $85 worth of DVDs when the 10% discount is applied before the $15 discount.

   c. Which order of discounts gives you a better deal? *Explain.*