

# Answer Key

## Practice C

- $x^5 - x^3 + 3x^2 + 6x - 9$ ;  
 $-x^5 + 3x^3 + 3x^2 - 2x + 7$
- $10x^{2/5} - 2x^{-1}$ ;  
 $2x^{2/5} + 8x^{-1}$
- $x^2 + 10x + 1$ ;  $x^2 - 4x - 3$
- $5x^{1/6} - 7x^3 - 1$ ;  $x^{1/6} + 3x^3 - 1$
- $x^5 + 4x^4 - x^3 - 15x^2 - 16x + 30$
- $5x^{5/8} - 5x^{1/4} - 3x^{3/8} + 3$
- $3x + x^{1/3}$
- $\frac{16}{x^{7/3}}$
- $f(g(x)) = (x^2 + 4)^{1/2}$ ;  $g(f(x)) = x + 4$
- $f(g(x)) = \frac{1}{(3x - 1)^2}$ ;  $g(f(x)) = \frac{3}{x^2} - 1$
- $f(g(x)) = (2x)^{3/4}$ ;  $g(f(x)) = 2x^{3/4}$
- $f(g(x)) = \frac{3}{2x^{1/2}}$ ;  $g(f(x)) = \frac{2\sqrt{3}}{x^{1/2}}$
- $f(g(x)) = \frac{1}{\sqrt{x^2 + 2x}}$ ; all real numbers less than  $-2$  or greater than  $0$
- $g(f(x)) = \frac{1 + 2x^{1/2}}{x}$ ; positive real numbers
- $\frac{f(x)}{g(x)} = \frac{1}{x^{5/2} + 2x^{3/2}}$ ; positive real numbers
- $\frac{g(x)}{f(x)} = x^{5/2} + 2x^{3/2}$ ; nonnegative real numbers
- $f(f(x)) = x^{1/4}$ ; nonnegative real numbers
- $g(g(x)) = x^4 + 4x^3 + 6x^2 + 4x$ ; all real numbers
- True
- False; Examples vary.
- True
- False; Examples vary.
- False; Examples vary.
- False; Examples vary.
- Sample answer:  $f(x) = \sqrt{x}$ ,  $g(x) = 2x + 1$
- Sample answer:  $f(x) = \frac{1}{x}$ ,  $g(x) = 3x + 2$

27. Let  $f(x) = 0.6x$ ,  $g(x) = x - 5$ ,  $h(x) = 0.9x$
- $f(g(h(x))) = 0.54x - 3$   
 $f(h(g(x))) = 0.54x - 2.7$   
 $g(f(h(x))) = 0.54x - 5$   
 $g(h(f(x))) = 0.54x - 5$   
 $h(f(g(x))) = 0.54x - 2.7$   
 $h(g(f(x))) = 0.54x - 4.5$ ; First the store will deduct the \$5 coupon. Then it makes no difference in what order they take the 40% and 10% discount.