1. Suppose f and g are the functions completely defined by the tables below:

x	$f(x)$
1	-2
-3	1
5	-4

x	$g(x)$
-4	1
-2	-3
1	5

Make a table of $f \circ g$ and a table of $g \circ f$.

2. Let $f(x) = \dfrac{7x+8}{x+4}$.
   (a) Find the domain of f.
   (b) Find the range of f.
   (c) Find a formula for f^{-1}.
   (d) Find the domain of f^{-1}.
   (e) Find the range of f^{-1}.

3. Find the maximum value of $5 - 8x - 2x^2$.

4. Write $\dfrac{27^{100}}{9^{45}}$ as a power of 3.

5. Give an example of a function that is neither even nor odd, and explain why it is neither.

6. Find a number t such that the line containing the points $(t, -5)$ and $(-3, 5)$ is perpendicular to the line that contains the points $(-5, 7)$ and $(1, 11)$.

7. Find a number t such that the equation $x^2 + tx + 3 = 0$ has exactly one solution.

8. Suppose $g(x) = 3 + \dfrac{x}{5x-2}$. Find the formula for g^{-1}.

9. What is the minimum value of the function f defined by $f(x) = 4x^2 - 8x + 11$? The graph of f is a parabola. Find the vertex of the parabola.

10. Let $f(-1) = 10$, $f(2) = 4$, and $f(3) = 2$. Make a table for $g(x)$ where $g(x) = 5f(3x+2) - 1$. Find the domain and range of $g(x)$.

11. Show that for every real number t, the point $(5 - 3t, 7 - 4t)$ is on the line containing the points $(2, 3)$ and $(5, 7)$.

12. Simplify $\left(\dfrac{xy^{-3}}{x^5y^{-10}z^3}\right)^{-3}$.

13. Find all real numbers x such that $2x^4 - 20x^2 - 22 = 0$.

14. Let $f(x) = \dfrac{3x^2 + 5x + 1}{2x^2 - 4x + 2}$. Find the horizontal and vertical asymptotes and zeros of $f(x)$.

15. Find two postive numbers whose difference equals 4 and whose product equals 15.

16. Write $\dfrac{(1+3i)^2}{5-2i}$ in $a + bi$ form.

17. Simplify the expression $\left(\dfrac{(t^3w^5)^{-3}}{(t^{-3}w^2)^4}\right)^{-2}$.

18. Suppose f is a function with domain $[1, 3]$ and range $[2, 5]$. Define functions g and h by

$$g(x) = 4f(x) \quad \text{and} \quad h(x) = f(3x).$$

(a) What is the domain of g?
(b) What is the range of g?
(c) What is the domain of h?
(d) What is the range of h?

19. Fill in the blank.

(a) Let $f(x)$ be a function and x be in the domain of f. Then $f^{-1}(f(x)) =$ _____.

(b) The equation of the graph $g(x)$ that is obtained by horizontally stretching the graph of $f(x)$ 5 units and by shifting down 7 units is _____.

(c) The degree of the polynomial $p(x) = 4 + 6x^5 + 3x^2$ is _____.

(d) The function $g(x) = 3x^3 + x$ is a function that is even, odd, or neither _____.

(e) An example of a polynomial of degree four whose only zeros are -3, 4, and 1 is _____.