Homework: Combinations of Functions; Composite Functions

In Problems 1-12, find the domain of each function

1. $f(x) = x^2 - 2$	2. $f(x) = \dfrac{5x}{3x-2}$
3. $f(x) = \lvert x-3 \rvert + 2$	4. $f(x) = \dfrac{2}{x^2-49}$
5. $f(x) = \dfrac{1}{x+3} - \dfrac{1}{2x-1}$	6. $f(x) = \dfrac{1}{x^2+4} + \dfrac{2}{x^2-8x+15}$
7. $f(x) = \dfrac{2}{\dfrac{1}{x}-3}$	8. $f(x) = \dfrac{5}{\dfrac{2}{x+3}-4}$
9. $f(x) = \sqrt{x+8}$	10. $f(x) = \sqrt{7x-2}$
11. $f(x) = \sqrt{x+5} - \sqrt{x-4}$	12. $f(x) = \dfrac{5x-1}{x^3+3x^2-25x-75}$

In Problems 13-16, find f + g, f – g, fg, and f/g

13. $f(x) = 3x+2, g(x) = 7x-1$	14. $f(x) = x^2 - 10x + 16, g(x) = x-2$
15. $f(x) = 3 + \dfrac{2}{x}, g(x) = \dfrac{2}{x}$	16. $f(x) = \sqrt{x-7}, g(x) = \sqrt{x+1}$

In Problems 17-24, find $a.\ \ f \circ g \quad b.\ \ g \circ f \quad c.\ \ (f \circ g)(3)$

17. $f(x) = 9x-1, g(x) = 3x+2$	18. $f(x) = x+3, g(x) = 2x-1$
19. $f(x) = 3x-2, g(x) = 4x^2 - 3x$	20. $f(x) = x^2+3, g(x) = x^2-7$
21. $f(x) = x+2, g(x) = x^2+3x-2$	22. $f(x) = \sqrt{x+5}, g(x) = x-7$
23. $f(x) = 5x, g(x) = \dfrac{x+7}{2}$	24. $f(x) = \dfrac{3}{x}, g(x) = \dfrac{3}{x}$

In Problems 25-28, find $f \circ g$

25. $f(x) = \dfrac{3x}{x+5}, g(x) = \dfrac{2}{x}$	26. $f(x) = \dfrac{7x-1}{x+2}, g(x) = \dfrac{3}{x}$
27. $f(x) = \sqrt{x}, g(x) = 3x-1$	28. $f(x) = x^2 + 3, g(x) = \sqrt{x+2}$