1. State the domain and range of the following functions.

(a). $y = x + 3$ **(b).** $y = \sqrt{x+3}$ **(c).** $y = x^2 - 9$

2. Find the domain of $y = \dfrac{1}{2x+4}$.

For the $f(x)$ and $g(x)$ given below, find and simplify **(a).** $(f \circ g)(x)$ **(b).** $(g \circ f)(x)$

3. $f(x) = 1 + x$ $g(x) = 2x^3$

4. $f(x) = \dfrac{1}{x}$ $g(x) = 2x^2 - 4$

5. $f(x) = \sqrt{x}$ $g(x) = x^6 + x^2$

For the $f(x)$ and $g(x)$ given below, find and simplify

(a). $(f + g)(x)$ **(b).** $(f - g)(x)$ **(c).** $(f \cdot g)(x)$ **(d).** $\left(\dfrac{f}{g}\right)(x)$

6. $f(x) = \dfrac{1}{2}x \qquad g(x) = x^2$

7. $f(x) = 2\sqrt{x} \qquad g(x) = \sqrt{x}$

8. $f(x) = (x - 1)^2 \qquad g(x) = x^2 - 1$

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1. (a). domain: all reals; range: all reals   **(b).** domain: all reals $x \geq -3$; range: $y \geq 0$ **(c).** domain: all reals; range: $y \geq -9$

2. all reals except $x = -2$

3. (a). $1 + 2x^3$ **(b).** $2(1 + x)^3$

4. (a). $\dfrac{1}{2x^2 - 4}$ **(b).** $\dfrac{2}{x^2} - 4$

5. (a). $\sqrt{x^6 + x^2}$ **(b).** $x^3 + x$

6. (a). $\dfrac{1}{2}x + x^2$ **(b).** $\dfrac{1}{2}x - x^2$ **(c).** $\dfrac{1}{2}x^3$ **(d).** $\dfrac{1}{2x}$

7. (a). $3\sqrt{x}$ **(b).** $\sqrt{x}$ **(c).** $2x$ **(d).** 2

8. (a). $2x^2 - 2x$ **(b).** $-2x + 2$ **(c).** $x^4 - 2x^3 + 2x - 1$ **(d).** $\dfrac{x - 1}{x + 1}$

Homework: Section 1.2, p. 73: #1(b), 3-6(all), 27-41(odd), 51-57(odd)