

Exercises — Functions

1. If $3x^2 - xy = 2y - 4$, express y as a function of x .
2. Find the domain of the function $f(x) = \frac{3x^2+4}{x+2}$.
3. Find the domain of the function $f(x) = \sqrt{4 - 9x^2}$.
4. Find the domain of the function $f(x) = \frac{\sqrt{4-9x^2}}{x+2}$.
5. Find the range of the function $f(x) = \sqrt{9x^2 + 4}$.
6. Find the range of the function $f(x) = \sqrt{4 - 9x^2}$.
7. For the function $f(x) = \frac{4x^3-x}{2x-1}$, find $f(-2)$, $f(0)$, $f(1)$, and $f(2)$.
8. For the function $f(x) = \frac{4x^2-16x}{2x}$, find $f(x+2)$ and simplify your answer.
9. For the function $g(x) = \frac{4x^2-16x}{2x-1}$, find $g(x^2)$.
10. For the function $g(x) = \frac{3}{\sqrt{x+1}-3}$, find $g((x-1)(x-1))$.
11. Find $f(g(\frac{1}{2}))$ and $g(f(\frac{1}{2}))$, where $f(x) = \frac{1}{\sqrt{x^2-4}}$ and $g(x) = \frac{2}{x}$.
12. Find $f(g(4))$ and $g(f(4))$, where $f(x) = \frac{1}{4-\sqrt{x}}$ and $g(x) = \frac{4}{x^2}$.
13. Find $\frac{f(x)}{g(x)}$ and simplify it, where $f(x) = \frac{4-\sqrt{x}}{x^2-1}$ and $g(x) = \frac{4-\sqrt{x}}{x+1}$.
14. Find $\frac{f(x+2)-f(2)}{x}$ and simplify it for the function $f(x) = 3x^2 + 2x - 1$.
15. Find $\frac{f(x+2)-f(2)}{x}$ and simplify it for the function $f(x) = \frac{1}{2x+1}$.