

1.1a - Let's get out func (tion) on!

Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x . The graph of f is the graph of the equation $y = f(x)$.

Find the domain and range. Sketch a graph if necessary. Practice using interval notation for domain and range.

1) $y = 3|x| + \frac{15}{4}$

D: $(-\infty, \infty)$

R: $[\frac{15}{4}, \infty)$

2) $f(x) = 2(x-3)^2 + 4$

D: $(-\infty, \infty)$

R: $[4, \infty)$

3) $y = |x+2|$

D: $(-\infty, \infty)$

R: $[0, \infty)$

4) $y = -2|x| - \frac{5}{4}$

D: $(-\infty, \infty)$

R: $(-\infty, -\frac{5}{4}]$

5) $f(x) = 3\left(x + \frac{5}{2}\right)^2 - 3$

D: $(-\infty, \infty)$

R: $[-3, \infty)$

6) $f(x) = 2(x+5)^{12} - 8$ ^{Even degree}

D: $(-\infty, \infty)$

R: $[-8, \infty)$

$$7) f(x) = -6(x-4)^5 + 1 \quad \text{Odd degree}$$

$$D: (-\infty, \infty)$$

$$R: (-\infty, \infty)$$

$$8) y = 4 - 2\sqrt{7x-2}$$

$$7x-2 \geq 0$$

$$x \geq \frac{2}{7}$$

$$D: \left[\frac{2}{7}, \infty\right)$$

$$R: (-\infty, 4]$$

$$9) y = \sqrt{-2x+5} - 3$$

$$-2x+5 \geq 0$$

$$x \leq \frac{5}{2}$$

$$D: \left(-\infty, \frac{5}{2}\right]$$

$$R: [-3, \infty)$$

$$10) f(x) = \frac{3}{x} + 2$$

$$D: (-\infty, 0) \cup (0, \infty)$$

$$R: (-\infty, 2) \cup (2, \infty)$$

$$11) f(x) = \frac{2}{x-2} + 3$$

$$D: (-\infty, 2) \cup (2, \infty)$$

$$R: (-\infty, 3) \cup (3, \infty)$$

$$12) f(x) = -\frac{2}{x+3} + 3$$

$$D: (-\infty, -3) \cup (-3, \infty)$$

$$R: (-\infty, 3) \cup (3, \infty)$$

Think about polynomials not in the same form we've discussed in class. What is the domain and range? How do you know? Do we have enough information right now to find this without a calculator?

$$13) f(x) = -x^5 + 4x^3 - x + 1 \quad \text{Odd degree}$$

$$D: (-\infty, \infty)$$

$$R: (-\infty, \infty)$$

$$14) f(x) = x^4 + x^3 - 4x^2 + 5 \quad \text{Even degree}$$

$$D: (-\infty, \infty)$$

R: Can not determine from standard form.