

Solutions to Exercises in Chapter 2

Solution to Exercise 2.1 (p. 21)

$\{x \mid x \neq 5\}$ since $x - 5 \neq 0$, $x \neq 5$

Solution to Exercise 2.2 (p. 21)

$\{x \mid x \neq 7\}$ since $x - 7 \neq 0$, $x \neq 7$

Solution to Exercise 2.3 (p. 21)

$\{x \mid x \neq \frac{5}{2}\}$ since $5 - 2x \neq 0$, $x \neq \frac{5}{2}$

Solution to Exercise 2.4 (p. 21)

$\{x \mid x \neq 3 \text{ or } -7\}$ since $x \neq 3$ and $x \neq -7$

Solution to Exercise 2.5 (p. 21)

$\{x \mid x \neq \frac{1}{2} \text{ or } 3\}$ since $2x^2 - 7x + 3 \neq 0$, $(2x - 1)(x - 3) \neq 0$, $2x - 1 \neq 0$ and $x - 3 \neq 0$, $x \neq \frac{1}{2}$ and $x \neq 3$

Solution to Exercise 2.6 (p. 21)

$\{x \mid x \neq -5\}$ since $(x + 5)^2 \neq 0$, $x + 5 \neq 0$, $x \neq -5$

Solution to Exercise 2.7 (p. 21)

$\{x \mid x \in \mathbb{R}\}$ since $x^2 + 25 \neq 0$, $x^2 \neq -25$, $x \in \mathbb{R}$

Solution to Exercise 2.8 (p. 21)

$\{x \mid x \in \mathbb{R}\}$ since $x^2 + 2 \neq 0$, $x^2 \neq -2$, $x \in \mathbb{R}$

Solution to Exercise 2.9 (p. 21)

$\{x \mid x \neq 3\}$ since $|x - 3| \neq 0$, $x - 3 \neq 0$, $x \neq 3$

Solution to Exercise 2.10 (p. 21)

$\{x \mid x \neq -4 \text{ or } 4\}$ since $|x| - 4 \neq 0$, $|x| \neq 4$, $x \neq -4$ and $x \neq 4$

Solution to Exercise 2.11 (p. 22)

$\{x \mid x \geq \frac{5}{2}\}$ since $2x - 5 \geq 0$, $2x \geq 5$, $x \geq \frac{5}{2}$

Solution to Exercise 2.12 (p. 22)

$\{x \mid x \leq 7\}$ since $7 - x \geq 0$, $-x \geq -7$, $x \leq 7$

Solution to Exercise 2.13 (p. 22)

$(-\infty, -2] \cup [2, \infty)$ since $4x^2 - 16 \geq 0$, $4x^2 \geq 16$, $x^2 \geq 4$, $x \leq -2$ or $x \geq 2$

Solution to Exercise 2.14 (p. 22)

$[\frac{-4}{5}, \frac{4}{5}]$ since $16 - 25x^2 \geq 0$, $-25x^2 \geq -16$, $x^2 \leq \frac{16}{25}$, $x \geq \frac{-4}{5}$ and $x \leq \frac{4}{5}$

Solution to Exercise 2.15 (p. 22)

$(-\infty, -1] \cup [7, \infty)$, $\sqrt{(x - 7)(x + 1)} \geq 0$

Solution to Exercise 2.16 (p. 22)

$(-\infty, 1/2] \cup [3, \infty)$, $2x^2 - 7x + 3 \geq 0$, $(2x - 1)(x - 3) \geq 0$, $x \leq \frac{1}{2}$ or $x \geq 3$

Solution to Exercise 2.17 (p. 22)

$(-\infty, \infty)$, since $x^2 + 4 \geq 0$, $x^2 \geq -4$ This will always be true, for all real numbers, any number squared is always positive

Solution to Exercise 2.18 (p. 22)

$(-\infty, 8]$ since $-x + 8 \geq 0$, $-x \geq -8$, $x \leq 8$

Solution to Exercise 2.19 (p. 22)

$(-\infty, \infty)$, since $6x^2 + 8 \geq 0$, $6x^2 \geq -8$, $x^2 \geq \frac{-8}{6}$ This will always be true, for all real numbers, any number squared is always positive

Solution to Exercise 2.20 (p. 22)

No solution since $-8 - 6x^2 \geq 0$, $-6x^2 \geq 8$, $x^2 \geq \frac{-8}{6}$. This will never be true, so there is no solution, since any number squared is always positive, so it will never be less than 0.

Solution to Exercise 2.21 (p. 23)

$(-\infty, 12]$ since $12 - x \geq 0$

Solution to Exercise 2.22 (p. 23)

$(-\infty, \infty)$ since there are no even-degree roots and it is not a rational function

Solution to Exercise 2.23 (p. 23)

$(-\infty, -5] \cup [-1, \infty)$ since $x^2 + 6x + 5 \geq 0$

Solution to Exercise 2.24 (p. 23)

$(-4, \infty)$ since $x + 4 > 0$

Solution to Exercise 2.25 (p. 23)

$(-\infty, 0) \cup (0, 7]$ since $7 - x \geq 0$ and $x \neq 0$

Solution to Exercise 2.26 (p. 23)

$(-\infty, 0) \cup (4, \infty)$ since $x^2 - 4x > 0$

Solution to Exercise 2.27 (p. 23)

$(-\infty, -2) \cup (-2, -1] \cup [1, 2) \cup (2, \infty)$ since $x^2 - 1 \geq 0$ and $x^2 - 4 \neq 0$

Solution to Exercise 2.28 (p. 23)

$[0, 25) \cup (25, \infty)$ since $\sqrt{x} + 5 \neq 0$ and $x \geq 0$

Solution to Exercise 2.29 (p. 23)

$(-1, \infty)$ since $x + 1 > 0$

