

12.3 Exercises

Exercise 12.1

Solve for x .

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|-------------------------------------|------------------------------------|
| ✓ a) $5x + 6 \leq 21$ | ✓ b) $3 + 4x > 10x$ |
| c) $2x + 8 \geq 6x + 24$ | d) $9 - 3x < 2x - 13$ |
| e) $-5 \leq 2x + 5 \leq 19$ | f) $15 > 7 - 2x \geq 1$ |
| g) $3x + 4 \leq 6x - 2 \leq 8x + 5$ | h) $5x + 2 < 4x - 18 \leq 7x + 11$ |

Exercise 12.2

Solve for x .

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|--|--|
| ✓ a) $x^2 - 5x - 14 > 0$ | ✓ b) $x^2 - 2x \geq 35$ |
| ✓ c) $x^2 - 4 \leq 0$ | d) $x^2 + 3x - 3 < 0$ |
| e) $2x^2 + 2x \leq 12$ | f) $3x^2 < 2x + 1$ |
| g) $x^2 - 4x + 4 > 0$ | ✓ h) $x^3 - 2x^2 - 5x + 6 \geq 0$ |
| i) $x^3 + 4x^2 + 3x + 12 < 0$ | j) $-x^3 - 4x < -4x^2$ |
| k) $x^4 - 10x^2 + 9 \leq 0$ | l) $x^4 - 5x^3 + 5x^2 + 5x < 6$ |
| m) $x^4 - 5x^3 + 6x^2 > 0$ | n) $x^5 - 6x^4 + x^3 + 24x^2 - 20x \leq 0$ |
| o) $x^5 - 15x^4 + 85x^3 - 225x^2 + 274x - 120 \geq 0,$ | |
| p) $x^{11} - x^{10} + x - 1 \leq 0$ | |

Exercise 12.3

Find the domain of the functions below.

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|-----------------------------------|---------------------------------------|
| a) $f(x) = \sqrt{x^2 - 8x + 15}$ | b) $f(x) = \sqrt{9x - x^3}$ |
| c) $f(x) = \sqrt{(x-1)(4-x)}$ | d) $f(x) = \sqrt{(x-2)(x-5)(x-6)}$ |
| e) $f(x) = \frac{5}{\sqrt{6-2x}}$ | f) $f(x) = \frac{1}{\sqrt{x^2-6x-7}}$ |

Exercise 12.4

Solve for x .

✓ a) $|2x + 7| > 9$ ✓ b) $|6x + 2| < 3$

✓ c) $|5 - 3x| \geq 4$ d) $|-x - 7| \leq 5$

e) $|1 - 8x| \geq 3$ f) $1 > |2 + \frac{x}{5}|$

Exercise 12.5

Solve for x .

✓ a) $\frac{x+2}{x+4} \geq 0$ b) $\frac{x-5}{2-x} > 0$ ✓ c) $\frac{9x-11}{7x+15} \leq 0$ ✓ d) $\frac{13x+4}{6x-1} \geq 0$

✓ e) $\frac{7x-2}{3x+8} < 0$ ✓ f) $\frac{4x-4}{x^2-4} \geq 0$ ✓ g) $\frac{x-2}{x^2-4x-5} < 0$ h) $\frac{x^2-9}{x^2-4} \geq 0$

i) $\frac{x-3}{x+3} \leq 4$ j) $\frac{1}{x+10} > 5$ k) $\frac{2}{x-2} \leq \frac{5}{x+1}$ l) $\frac{x^2}{x+4} \leq x$