

Exercises

Task 5.32 Solve the equations.

- a. $(x^2 - 4)\sqrt{1 - x} = 0$.
- b. $x - \sqrt{x + 1} = 5$.
- c. $x + \sqrt{10x + 6} = 9$.
- d. $\sqrt{4 + 2x - x^2} = x - 2$.
- e. $\sqrt{2x - 3} + \sqrt{4x + 1} = 4$.
- f. $x = 15 + \sqrt{9 + 8x - x^2}$.

Task 5.33 Solve the inequalities.

- a. $\sqrt{5 - x} < -2$.
- b. $\sqrt{x + 3} > -23$.
- c. $\sqrt{2x + 3} > x + 2$.
- d. $\sqrt{x + 3} + \sqrt{3x - 2} \leq 7$.
- e. $\sqrt{x - 2} + x > 4$.
- f. $\sqrt{8 - x} > x - 6$.

Task 5.34 The circular velocity, v , in miles per hour, of a satellite orbiting Earth is given by the formula $v = \sqrt{\frac{1.24 \cdot 10^{12}}{r}}$, where r is a distance in miles from the satellite to the center of the Earth. How much greater is the velocity of a satellite orbiting at an altitude of 100 mi than one orbiting at 300 mi?

(Radius of a the Earth is 3950 mi, 1 mi = 1,609344 km)



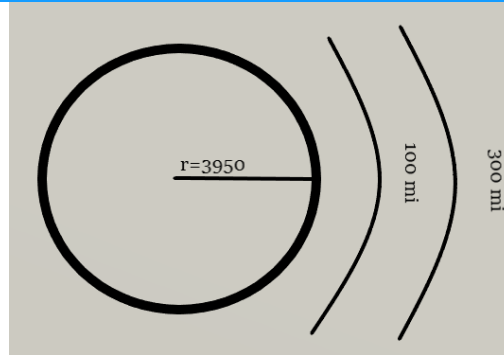


Figure 5.42

Answers

5.33

- $x_1 = -2, x_2 = 1.$
- $x = 8.$
- $x = 3.$
- $x = 3.$
- $x = 2.$
- No solutions.

5.34

- No solutions.
- $x \in [-3, \infty)$
- No solutions.
- $x \in \left[\frac{2}{3}, 6\right].$
- $x \in (3, \infty).$
- $x \in (-\infty, 7).$

5.35 The velocity of a satellite orbiting at an altitude of 100 mi is 1.024 times greater than one orbiting at 300 mi.



Sample chapter exam

1. Determine in which set the functions are equal:

$$f(x) = \sqrt{(x-1)(x-5)} \quad \text{and} \quad g(x) = \sqrt{(x-1)} \cdot \sqrt{x-5}.$$

2. Solve the equations.

a. $\sqrt{x+3} + \sqrt{x} = 3.$

b. $3 - \sqrt{x-1} = \sqrt{3x-2}.$

c. $(x^2 + x - 6)^{0.5} = \frac{1}{2}x - 1.$

3. Solve the inequalities.

a. $x - 1 < \sqrt{7-x}.$

b. $\sqrt{(x-6)(1-x)} < 2x + 3.$

c. $\sqrt{1+10x+5x^2} \geq 7 - 2x - x^2.$

4.* Find the domain of the given function $f(x) = \log_{17}(x + \sqrt{x^2 + 1}).$

a

