

5.2 Solving Equations Using the Square Root Property

Solutions

Solve each equation by applying the square root property.	
<p>1. $x^2 = 36$</p> $\sqrt{x^2} = \pm\sqrt{36}$ $x = \pm 6$ <div style="border: 1px solid red; padding: 2px; display: inline-block; margin-left: 100px;">{± 6}</div>	<p>2. $x^2 = 121$</p>
<p>3. $x^2 = -36$</p> $\sqrt{x^2} = \pm\sqrt{-36}$ $x = \pm\sqrt{-1 \cdot 36}$ $x = \pm\sqrt{-1} \cdot \sqrt{36}$ $x = \pm 6i$ <div style="border: 1px solid red; padding: 2px; display: inline-block; margin-left: 100px;">{± 6i}</div>	<p>4. $x^2 = -121$</p>
<p>5. $(x + 2)^2 = 36$</p> $\sqrt{(x + 2)^2} = \pm\sqrt{36}$ $x + 2 = \pm 6$ $x + 2 = 6 \text{ or } x + 2 = -6$ $x \quad \quad \quad \underline{-2} \quad \underline{-2} \quad \quad \quad \underline{-2} \quad \underline{-2}$ $x = 4 \text{ or } x = -8$ <div style="border: 1px solid red; padding: 2px; display: inline-block; margin-left: 100px;">{4, -8}</div>	<p>6. $(x - 1)^2 = 25$</p>
<p>7. $(3x + 5)^2 = 1$</p> $\sqrt{(3x + 5)^2} = \pm\sqrt{1}$ $3x + 5 = \pm 1$ $3x + 5 = 1 \text{ or } 3x + 5 = -1$ $\underline{-5} \quad \underline{-5} \quad \quad \quad \underline{-5} \quad \underline{-5}$ $3x = -4 \text{ or } 3x = -6$ $\frac{3x}{3} = \frac{-4}{3} \quad \quad \quad \frac{3x}{3} = \frac{-6}{3}$ $x = -\frac{4}{3} \text{ or } x = -2$ <div style="border: 1px solid red; padding: 2px; display: inline-block; margin-left: 100px;">{-\frac{4}{3}, -2}</div>	<p>8. $(4x - 5)^2 = 4$</p>
<p>Answers: 1. {± 6}; 3. {± 6i}; 5. {-8, 4}; 7. $\left\{-\frac{4}{3}, -2\right\}$</p>	

Solve each equation by applying the square root property.	
<p>9. $(x+2)^2 = -36$</p> $\sqrt{(x+2)^2} = \pm\sqrt{-36}$ $x+2 = \frac{\pm 6i}{-2} \frac{-2}{-2}$ $x = -2 \pm 6i$ <div style="border: 1px solid red; padding: 2px; display: inline-block;">$\{-2 \pm 6i\}$</div>	<p>10. $(x-1)^2 = -25$</p>
<p>11. $(2x+5)^2 = 9$</p> $\sqrt{(2x+5)^2} = \pm\sqrt{9}$ $2x+5 = \pm 3$ $2x+5 = \frac{3}{-5} \frac{-5}{-5} \quad \text{or} \quad 2x+5 = \frac{-3}{-5} \frac{-5}{-5}$ $2x = \frac{-2}{2} \quad \text{or} \quad 2x = \frac{-8}{2}$ $\frac{2x}{2} = \frac{-2}{2} \quad \frac{2x}{2} = \frac{-8}{2}$ $x = -1 \quad \text{or} \quad x = -4$ <div style="border: 1px solid red; padding: 2px; display: inline-block;">$\{-1, -4\}$</div>	<p>12. $(2x+1)^2 = 49$</p>
<p>13. $(2x+3)^2 = -25$</p> $\sqrt{(2x+3)^2} = \pm\sqrt{-25}$ $2x+3 = \frac{\pm 5i}{-3} \frac{-3}{-3}$ $2x = \frac{-3 \pm 5i}{2}$ $\frac{2x}{2} = \frac{-3 \pm 5i}{2}$ $x = -\frac{3}{2} \pm \frac{5i}{2}$ <div style="border: 1px solid red; padding: 2px; display: inline-block;">$\{-\frac{3}{2} \pm \frac{5i}{2}\}$</div>	<p>14. $(2x+7)^2 = -1$</p>
<p>15. $(6x-2)^2 = 20$</p> $\sqrt{(6x-2)^2} = \pm\sqrt{20}$ $6x-2 = \frac{\pm 2\sqrt{5}}{+2} \frac{+2}{+2}$ $6x = \frac{2 \pm 2\sqrt{5}}{6}$ $\frac{6x}{6} = \frac{2 \pm 2\sqrt{5}}{6}$ <div style="border: 1px solid red; padding: 2px; display: inline-block;">$\{\frac{1 \pm \sqrt{5}}{3}\}$</div> $x = \frac{2}{6} \pm \frac{2\sqrt{5}}{6} = \frac{1}{3} \pm \frac{\sqrt{5}}{3} \quad \text{or} \quad \frac{1 \pm \sqrt{5}}{3}$	<p>16. $(4x+2)^2 = 40$</p>
<p>Answers: 9. $\{-2 \pm 6i\}$; 11. $\{-1, -4\}$; 13. $\{-\frac{3}{2} \pm \frac{5i}{2}\}$; 15. $\{\frac{1 \pm \sqrt{5}}{3}\}$</p>	