

Solve each equation.

1. $2\sqrt{3x+13} - 3 = 2x + 7$

2. $(x+10)^{\frac{4}{3}} - 5 = 11$

3. $\sqrt{24-4x} - x = -3$

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ANSWERS

1. $2\sqrt{3x+13} - 3 = 2x + 7$

$$\frac{2\sqrt{3x+13}}{2} = \frac{2x+10}{2}$$

$$(\sqrt{3x+13})^2 = (x+5)^2$$

$$3x+13 = x^2+10x+25$$

$$-3x-13 \quad -3x-13$$

$$0 = x^2+7x+12$$

$$0 = (x+3)(x+4)$$

$$x = -3, -4$$

2. $(x+10)^{\frac{4}{3}} - 5 = 11$

$$((x+10)^{\frac{4}{3}})^{\frac{3}{4}} = (16)^{\frac{3}{4}} \rightarrow (\sqrt[4]{16})^3$$

$$= (\pm 2)^3$$

$$= \pm 8$$

$$x+10 = \pm 8$$

$$-10 \quad -10$$

$$x = -2, -18$$

3. $\sqrt{24-4x} - x = -3$

$$(\sqrt{24-4x})^2 = (x-3)^2$$

$$24-4x = x^2-6x+9$$

$$-24+4x \quad +4x-24$$

$$0 = x^2-2x-15$$

$$0 = (x-5)(x+3)$$

$$x = 5, -3$$

$$x = 5 \text{ only}$$