

## SOLVING RADICAL EQUATIONS WS 1

$$1) 1 + x\sqrt{2} = 0$$

$$x\sqrt{2} = -1$$

$$x = \frac{-1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$$

$$x = \frac{-\sqrt{2}}{2}$$

$$2) 6 + 2x\sqrt{3} = 0$$

$$2x\sqrt{3} = -6$$

$$x = \frac{-3}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$$

$$x = -\sqrt{3}$$

$$3) x\sqrt{2} + 3x = 4$$

$$x(\sqrt{2} + 3) = 4$$

$$x = \frac{4}{(3+\sqrt{2})(3-\sqrt{2})}$$

$$x = \frac{12 - 4\sqrt{2}}{7}$$

$$4) x - x\sqrt{5} = 2$$

$$x(1 - \sqrt{5}) = 2$$

$$x = \frac{2}{(1-\sqrt{5})(1+\sqrt{5})}$$

$$x = \frac{2 + 2\sqrt{5}}{-4}$$

$$x = \frac{-1 - \sqrt{5}}{2}$$

$$5) \sqrt{x-4} - 3 = 0$$

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

$$x-4 = 9$$

$$x = 13$$

$$6) \sqrt{x-5} - 7 = 0$$

$$\sqrt{x-5} = 7$$

$$x-5 = 49$$

$$x = 54$$

$$7) \sqrt[3]{x+1} = 2$$

$$x+1 = 8$$

$$x = 7$$

$$8) \sqrt[3]{x-1} = 3$$

$$x-1 = 27$$

$$x = 28$$

$$9) \sqrt[4]{3x} = 2$$

$$3x = 16$$

$$x = \frac{16}{3}$$

$$10) \sqrt[4]{4x} = 3$$

$$4x = 81$$

$$x = \frac{81}{4}$$

$$11) \sqrt{2x+3} = 7$$

$$2x+3 = 49$$

$$2x = 46$$

$$x = 23$$

$$12) \sqrt{3x-5} = 4$$

$$3x-5 = 16$$

$$3x = 21$$

$$x = 7$$

$$13) \sqrt{4x+8} = 2$$

$$4x+8 = 4$$

$$4x = -4$$

$$\boxed{x = -1}$$

$$14) \sqrt{1+2x} = 3$$

$$1+2x = 9$$

$$2x = 8$$

$$\boxed{x = 4}$$

$$15) \sqrt{5x+1} = 4$$

$$5x+1 = 16$$

$$5x = 15$$

$$\boxed{x = 3}$$

$$16) \sqrt[4]{2x+3} = -1$$

$$2x+3 = 1$$

$$2x = -2$$

$$x = -1$$

$$\boxed{\emptyset}$$

$$17) \sqrt{3x+1} = 8$$

$$3x+1 = 64$$

$$3x = 63$$

$$\boxed{x = 21}$$

$$18) \sqrt[3]{x+5} = -2$$

$$x+5 = -8$$

$$\boxed{x = -13}$$

$$19) x = \sqrt{x+12}$$

$$x^2 = x+12$$

$$x^2 - x - 12 = 0$$

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

$$\boxed{x = 4 \quad x = -3}$$

$$20) \sqrt{x+18} + 2 = x$$

$$\sqrt{x+18} = x-2$$

$$x+18 = (x-2)^2$$

$$x+18 = x^2 - 4x + 4$$

$$0 = x^2 - 5x - 14$$

$$(x-7)(x+2) = 0$$

$$\boxed{x = 7} \quad x = -2$$

$$21) \sqrt{3x-11} = x-3$$

$$3x-11 = (x-3)^2$$

$$3x-11 = x^2 - 6x + 9$$

$$0 = x^2 - 9x + 20$$

$$(x-5)(x-4) = 0$$

$$\boxed{x = 5 \quad x = 4}$$