

$$(15) \sqrt{11x+3} - 2x = 0$$

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

$$11x+3 = 4x^2$$

$$-11x-3 \quad -11x-3$$

$$4x^2 - 11x - 3 = 0$$

$$4x^2 - 12x + x - 3 = 0$$

$$4x(x-3) + 1(x-3) = 0$$

$$(4x+1)(x-3) = 0$$

$$4x+1=0 \quad x-3=0$$

$$4x=-1 \quad x=3$$

$$x = -1/4$$

$$\text{extraneous}$$

$$\text{ck} \quad \sqrt{11(3)+3} \stackrel{?}{=} 2(3)$$

$$\sqrt{33+3} \stackrel{?}{=} 6$$

$$\sqrt{36} = 6 \checkmark$$

$$\sqrt{11(-1/4)+3} \stackrel{?}{=} 2(-1/4)$$

$$\sqrt{-11/4+12/4} \stackrel{?}{=} -1/2$$

$$\sqrt{1/4} = -1/2$$

$$1/2 \neq -1/2$$

$$(16) \sqrt{5x+4} - 3x = 0$$

$$\sqrt{5x+4} = 3x$$

$$5x+4 = 9x^2$$

$$-5x-4 \quad -5x-4$$

$$9x^2 - 5x - 4 = 0$$

$$(9x+4)(x-1) = 0$$

$$9x+4=0 \quad x-1=0$$

$$9x=-4 \quad x=1$$

$$x = -4/9$$

$$\text{ck} \quad \sqrt{5(1)+4} - 3(1) \stackrel{?}{=} 0$$

$$\sqrt{5+4} - 3 \stackrel{?}{=} 0$$

$$\sqrt{9} - 3 \stackrel{?}{=} 0$$

$$3 - 3 = 0 \checkmark$$

$$\sqrt{5(-4/9)+4} - 3(-4/9) \stackrel{?}{=} 0$$

$$\sqrt{-20/9+36/9} - 12/9 \stackrel{?}{=} 0$$

$$\sqrt{16/9} - 4/3 \stackrel{?}{=} 0$$

$$4/3 - 4/3 = 0$$

$$\text{extraneous}$$

$$(17) \sqrt{3x+13} - 5 = x$$

$$\sqrt{3x+13} = x+5$$

$$3x+13 = x^2+5x+5x+25$$

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

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

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

$$x+3=0 \quad x+4=0$$

$$x=-3 \quad x=-4$$

$$\text{ck} \quad \sqrt{3(-3)+13} - 5 \stackrel{?}{=} -3$$

$$\sqrt{-9+13} - 5 \stackrel{?}{=} -3$$

$$\sqrt{4} - 5 \stackrel{?}{=} -3$$

$$2 - 5 = -3 \checkmark$$

$$\sqrt{3(-4)+13} - 5 \stackrel{?}{=} -4$$

$$\sqrt{-12+13} - 5 \stackrel{?}{=} -4$$

$$\sqrt{1} - 5 \stackrel{?}{=} -4$$

$$1 - 5 = -4 \checkmark$$

$$(18) \sqrt{x+7} + 5 = x$$

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

$$x+7 = x^2-5x-5x+25$$

$$-x-7 \quad -x-7$$

$$x^2-11x+18=0$$

$$(x-2)(x-9)=0$$

$$x-2=0 \quad x-9=0$$

$$x=2 \quad x=9$$

$$\text{ck} \quad \sqrt{2+7} + 5 \stackrel{?}{=} 2$$

$$\sqrt{9} + 5 \stackrel{?}{=} 2$$

$$3 + 5 \stackrel{?}{=} 2$$

$$8 \neq 2$$

$$\sqrt{9+7} + 5 \stackrel{?}{=} 9$$

$$\sqrt{16} + 5 \stackrel{?}{=} 9$$

$$4 + 5 \stackrel{?}{=} 9$$

$$9 = 9 \checkmark$$

$$(19) \sqrt{x+3} - 1 = x$$

$$\sqrt{x+3} = x+1$$

$$x+3 = x^2+x+x+1$$

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

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

$$(x+2)(x-1)=0$$

$$x+2=0 \quad x-1=0$$

$$x=-2 \quad x=1$$

$$\text{extraneous}$$

$$\text{ck} \quad \sqrt{2+3} - 1 \stackrel{?}{=} -2$$

$$\sqrt{5} - 1 \stackrel{?}{=} -2$$

$$1 - 1 \stackrel{?}{=} -2$$

$$0 \neq -2$$

$$\sqrt{1+3} - 1 \stackrel{?}{=} 1$$

$$\sqrt{4} - 1 \stackrel{?}{=} 1$$

$$2 - 1 \stackrel{?}{=} 1$$

$$1 = 1 \checkmark$$

$$(20) \sqrt{5-x} = x+1$$

$$5-x = x^2+x+x+1$$

$$-5+x \quad -5+x$$

$$x^2+3x-4=0$$

$$(x-1)(x+4)=0$$

$$x-1=0 \quad x+4=0$$

$$x=1 \quad x=-4$$

$$\text{ck} \quad \sqrt{5-1} \stackrel{?}{=} 1+1$$

$$\sqrt{4} \stackrel{?}{=} 2$$

$$2 = 2 \checkmark$$

$$\sqrt{5-4} \stackrel{?}{=} -4+1$$

$$\sqrt{1} \stackrel{?}{=} -3$$

$$1 \neq -3$$

$$(21) \sqrt{3x} = \sqrt{x+6}$$

$$3x = x+6$$

$$-x \quad -x$$

$$2x = 6$$

$$x = 3$$

$$\text{ck} \quad \sqrt{3(3)} = \sqrt{3+6}$$

$$\sqrt{9} = \sqrt{9} \checkmark$$

$$(22) \sqrt{3x+7} = x-1$$

$$3x+7 = x^2-x-x+1$$

$$-3x-7 \quad -3x-7$$

$$x^2-5x-6=0$$

$$(x-6)(x+1)=0$$

$$x-6=0 \quad x+1=0$$

$$x=6 \quad x=-1$$

$$\text{ck} \quad \sqrt{3(6)+7} \stackrel{?}{=} 6-1$$

$$\sqrt{18+7} \stackrel{?}{=} 5$$

$$\sqrt{25} = 5$$

$$5 = 5 \checkmark$$

$$\sqrt{3(-1)+7} \stackrel{?}{=} -1-1$$

$$\sqrt{-3+7} \stackrel{?}{=} -2$$

$$\sqrt{4} \stackrel{?}{=} -2$$

$$2 \neq -2$$