

099 §7.6 #s 1-65, 4th prob, plus #19

Solve.

1)  $\sqrt{2x} = 4$

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

$2x = 16$

$x = 8$

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

$\emptyset$

No sol'n

9)  $\sqrt{2x-3} - 2 = 1$

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

$2x-3 = 3^2$

$2x-3 = 9$

$2x = 12$

$x = 6$

13)  $\sqrt[3]{x-2} - 3 = 0$

$\sqrt[3]{x-2} = 3$

$(\sqrt[3]{x-2})^3 = 3^3$

$x-2 = 27$

$x = 29$

17)  $x - \sqrt{4-3x} = -8$

$-x = -x$

$-\sqrt{4-3x} = -x-8$

$\sqrt{4-3x} = x+8$

$(\sqrt{4-3x})^2 = (x+8)^2$

$(a+b)^2 = a^2 + 2ab + b^2$

$4-3x = x^2 + 16x + 64$

$-4+3x = x^2 + 16x + 60$

$0 = x^2 + 19x + 60$

$x^2 + 15x + 4x + 60 = 0$

$x(x+15) + 4(x+15) = 0$

$(x+15)(x+4) = 0$  FINAL

$x = -15$  OR  $x = -4$  ANS.

DOESN'T CHECK!

Scratch:

2 | 60 15+4=19  
2 | 30 (15)(4)=60 ✓  
3 | 15  
5

099 § 7.6 #s 21, 25, ..., 65

Check #17:

$$-15 - \sqrt{4 - 3(-15)} = -8?$$

$$-15 - \sqrt{4 + 45} = -8?$$

$$-15 - \sqrt{49} = -8?$$

$$-15 - 7 = -8? \text{ No}$$

$$-4 - \sqrt{4 - 3(-4)} = -8?$$

$$-4 - \sqrt{4 + 12} = -8?$$

$$-4 - \sqrt{16} = -8?$$

$$-4 - 4 = -8? \checkmark$$

(21)  $\sqrt{x-3} + \sqrt{x+2} = 5$

$$\sqrt{x-3} = -\sqrt{x+2} + 5$$

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

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

$$x-3 = x+2 - 10\sqrt{x+2} + 25$$

$$-x+3 = -x+3$$

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$$0 = 5 - 10\sqrt{x+2} + 25$$

$$-10\sqrt{x+2} + 30 = 0$$

$$10\sqrt{x+2} = 30$$

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

$$x+2 = 3^2 = 9$$

$$\boxed{x=7}$$

$$(a+b)^2 = a^2 + 2ab + b^2$$

$$\sqrt{7-3} + \sqrt{7+2} = 5$$

$$\sqrt{4} + \sqrt{9} = 5$$

$$2 + 3 = 5 \checkmark$$

099 § 7.6 #s 25, 29, 33, 41, 65

$$(25) -\sqrt{2x} + 4 = -6$$

$$-\sqrt{2x} = -10$$

$$\sqrt{2x} = 10$$

$$2x = 10^2$$

$$\boxed{x = 50}$$

$$(29) \sqrt[4]{4x+1} - 2 = 0$$

$$\sqrt[4]{4x+1} = 2$$

$$\left(\sqrt[4]{4x+1}\right)^4 = 2^4$$

$$4x+1 = 16$$

$$4x = 15$$

$$\boxed{x = \frac{15}{4}}$$

$$(33) \sqrt[3]{6x-3} - 3 = 0$$

$$\sqrt[3]{6x-3} = 3$$

$$\left(\sqrt[3]{6x-3}\right)^3 = 3^3$$

$$6x-3 = 27$$

$$6x = 30$$

$$\boxed{x = 5}$$

$$(37) \sqrt{x+4} = \sqrt{2x-5}$$

$$x+4 = 2x-5$$

$$-x = -9$$

$$\boxed{x = 9}$$

$$(41) \sqrt[3]{-6x-1} = \sqrt[3]{-2x-5}$$

$$-6x-1 = -2x-5$$

$$-4x = -4$$

$$\boxed{x = 1}$$

099 \$7.6 #s 45, 49, m, 65

$$(45) \sqrt{2x-1} = \sqrt{1-2x}$$

$$2x-1 = 1-2x$$

$$4x = 2$$

$$\boxed{x = \frac{1}{2}}$$

$$(49) \sqrt{y+3} - \sqrt{y-3} = 1$$

$$\sqrt{y+3} = \sqrt{y-3} + 1$$

$$(\sqrt{y+3})^2 = (\sqrt{y-3} + 1)^2$$

$$y+3 = (\sqrt{y-3})^2 + 2\sqrt{y-3} + 1^2$$

$$y+3 = y-3 + 2\sqrt{y-3} + 1$$

$$y+3 = y + 2\sqrt{y-3} - 2$$

$$\begin{array}{r} -y+2 = -y \qquad \qquad \qquad +2 \\ \hline \end{array}$$

$$5 = 2\sqrt{y-3}$$

$$2\sqrt{y-3} = 5$$

$$\sqrt{y-3} = \frac{5}{2}$$

$$y-3 = \left(\frac{5}{2}\right)^2 = \frac{5^2}{2^2} = \frac{25}{4}$$

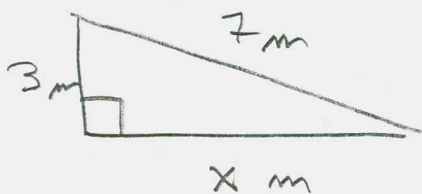
$$y = \frac{25}{4} + 3 = \frac{25}{4} + \left(\frac{3}{1}\right)\left(\frac{4}{4}\right) = \frac{25+12}{4} = \boxed{\frac{37}{4} = y}$$

099 \$7.6 #s 53, 57, 61, 65

Exact Ans.

(53)

Find the unknown length: 1-decimal  
Ans



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

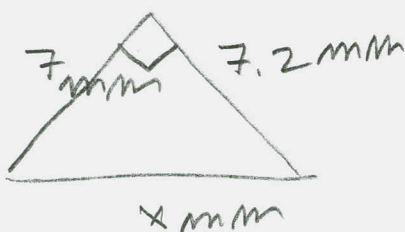
$$x^2 = 49 - 9 = 40$$

$$x = \pm \sqrt{40} = \pm \sqrt{4 \cdot 10} = \pm 2\sqrt{10}$$

Length is positive:

$$x = 2\sqrt{10} \text{ m} \approx 6.3 \text{ m}$$

(57)



$$7^2 + (7.2)^2 = x^2$$

$$x^2 = 49 + 51.84$$

$$x^2 = 100.84$$

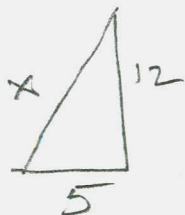
$$x = \pm \sqrt{100.84}$$

$$x = \sqrt{100.84} \text{ mm}$$

$$\approx 10.0 \text{ mm}$$

(61) Spotlight is 12 ft up. Flower bed is 5 ft. wide. How long is ladder needed (to avoid flowers)?

x = ladder length (ft)



$$x^2 = 5^2 + 12^2 = 25 + 144 = 169$$

$$x = \pm \sqrt{169} = \pm 13$$

$$x = 13 \text{ ft}$$

099 §7.6 #65

(65)

Given  $v = \sqrt{2gh}$ , where  
 $v$  = velocity in ft per sec ( $\frac{\text{ft}}{\text{s}}$ )  
 $g$  = acceleration of gravity ( $32 \frac{\text{ft}}{\text{s}^2}$ )

$h$  = distance object falls (ft)

If  $v = 80$ , what's  $h$ ?

$$80 = \sqrt{2(32)h} = \sqrt{64h} = 8\sqrt{h}$$

$$8\sqrt{h} = 80$$

$$\sqrt{h} = 10$$

$$h = 100 \text{ ft}$$