

10.5 (some more)

$$\begin{aligned} \text{ex 78 } \sqrt[3]{\frac{m^9}{9}} &= \frac{\sqrt[3]{m^9}}{\sqrt[3]{9}} = \frac{m^3}{\sqrt[3]{9}} \cdot \frac{\sqrt[3]{9^2}}{\sqrt[3]{9^2}} \\ &= \frac{m^3 \sqrt[3]{9^2}}{\sqrt[3]{9^3}} = \frac{m^3 \sqrt[3]{9^2}}{9} \end{aligned}$$

$$\text{ex 80 } \sqrt[4]{\frac{81}{y}} = \frac{3}{\sqrt[4]{y}} \cdot \frac{\sqrt[4]{y^3}}{\sqrt[4]{y^3}} = \frac{3 \sqrt[4]{y^3}}{\sqrt[4]{y^4}} = \frac{3 \sqrt[4]{y^3}}{y}$$

ex "test"

$$\begin{aligned} \frac{\sqrt[3]{81 x^2 z^9}}{\sqrt[3]{3 x^7 y^5 z^2}} &= \frac{\sqrt[3]{27 z^7}}{\sqrt[3]{1 x^6 y^3}} = \frac{3 \sqrt[3]{z^6} \sqrt[3]{z}}{1 x^2 y} \\ &= \frac{3 z^2 \sqrt[3]{z}}{x^2 y} \end{aligned}$$

~~xyy~~  
y y y x y y

ex 84

$$\frac{4}{5+\sqrt{6}} \cdot \frac{\sqrt{6}}{\sqrt{6}} = \frac{4\sqrt{6}}{5\sqrt{6}+6}$$

$$\frac{4}{5+\sqrt{6}} \cdot \frac{5-\sqrt{6}}{5-\sqrt{6}} = \frac{20-4\sqrt{6}}{25-6}$$

$$= \frac{20-4\sqrt{6}}{19}$$

ex

$$\frac{6+8\sqrt{2}}{12} = \frac{3+4\sqrt{2}}{6}$$

$$\frac{2(3+4\sqrt{2})}{6}$$

ex 88

$$\frac{-1}{3\sqrt{2}-2\sqrt{7}} \cdot \frac{3\sqrt{2}+2\sqrt{7}}{3\sqrt{2}+2\sqrt{7}} = \frac{-3\sqrt{2}-2\sqrt{7}}{9 \cdot 2 - 4 \cdot 7}$$

$$= \frac{-3\sqrt{2}-2\sqrt{7}}{-10} = -(-5)$$

$$= \frac{3\sqrt{2}+2\sqrt{7}}{10}$$

$$\begin{aligned} \text{ex 92} \quad \frac{(r-9) \cdot (\sqrt{r}+3)}{\sqrt{r}-3 \cdot \sqrt{r}+3} &= \frac{\cancel{(r-9)}(\sqrt{r}+3)}{\cancel{r-9}} \\ &= \sqrt{r}+3 \end{aligned}$$

$$\text{ex 100} \quad \frac{\overset{2}{\cancel{24}} + \overset{1}{\cancel{12}}\sqrt{5}}{\overset{+2}{\cancel{12}}} = 2 + \sqrt{5}$$

$$\text{ex 102} \quad \frac{\overset{-1}{\cancel{-5}} + \overset{1}{\cancel{5}}\sqrt{2}}{\overset{-5}{\cancel{5}}} = -1 + \sqrt{2}$$

$$\frac{\overset{1}{\cancel{5}}}{\overset{1}{\cancel{5}}} \cdot \frac{-5 + 5\sqrt{2}}{5}$$

10.6 p. 648

ex 8  $(\sqrt{x+1})^2 = (7)^2$

$$x + 1 = 49$$

$$\begin{array}{r} -1 \quad -1 \end{array}$$

$$x = 48$$

ex 12  $\sqrt{5k-3} + 2 = 0$

$$\begin{array}{r} -2 \quad -2 \end{array}$$

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

$$\begin{array}{r} 5k-3 = 4 \\ +3 \quad +3 \end{array}$$

$$5k = 7$$

$$k = \frac{7}{5}$$

no solution

check

$$\sqrt{5(\frac{7}{5})-3} + 2 \stackrel{?}{=} 0$$

$$\sqrt{7-3} + 2 \stackrel{?}{=} 0$$

$$\sqrt{4} + 2 \stackrel{?}{=} 0$$

$$2 + 2 \stackrel{?}{=} 0$$

$$\underline{\text{ex 18}} \quad \left(\sqrt{4x-2}\right)^2 = \left(\sqrt{3x+5}\right)^2$$

$$\begin{array}{r} 4x - 2 \\ -3x \quad +2 \\ \hline x \end{array} = \begin{array}{r} 3x + 5 \\ -3x \quad +2 \\ \hline x \end{array}$$

$$x = 7$$

$$\sqrt{26} = \sqrt{26}$$

$$\underline{\text{ex 20}} \quad \left(2\sqrt{x}\right)^2 = \left(\sqrt{5x-16}\right)^2$$

$$\begin{array}{r} 4x \\ -5x \end{array} = \begin{array}{r} 5x - 16 \\ -5x \end{array}$$

$$-x = -16$$

$$x = 16$$

$$\text{ex 56} \quad (\sqrt{4x+7} - 4)^2 = (\sqrt{4x-1})^2$$

$$(\sqrt{4x+7} - 4)(\sqrt{4x+7} - 4) = 4x - 1$$

$$4x + 7 - 4\sqrt{4x+7} - 4\sqrt{4x+7} + 16 = 4x - 1$$

$$\begin{array}{r} 4x + 23 - 8\sqrt{4x+7} = 4x - 1 \\ -4x - 23 \qquad \qquad \qquad -4x - 23 \end{array}$$

$$\frac{-8\sqrt{4x+7}}{-8} = \frac{-24}{-8}$$

$$(\sqrt{4x+7})^2 = (3)^2$$

$$4x + 7 = 9$$

$$-7 \qquad -7$$

$$4x = 2$$

~~$x = \frac{1}{2}$~~  no soln.

$$\text{ex 24} \quad (x = \sqrt{x^2 - 3x + 18})^2$$

6

$$\begin{array}{r} x^2 = x^2 - 3x + 18 \\ -x^2 \quad -x^2 \end{array}$$

$$\begin{array}{r} \sqrt{36 - 18 + 18} \\ \sqrt{36} \\ 6 \end{array}$$

$$0 = -3x + 18$$

$$3x = 18$$

$$x = 6$$

ex 32  $\left(\sqrt{x^2 - 15x + 15}\right)^2 = (x - 5)^2$   $\sqrt{(x-5)(x-5)}$

$$\begin{array}{r} \cancel{x^2} - 15x + \cancel{15} = \cancel{x^2} - 10x + 25 \\ -\cancel{x^2} + 10x - \cancel{15} \quad -\cancel{x^2} + 10x - 15 \end{array}$$

$$\sqrt{4 + 30 + 15}$$

$$\sqrt{49}$$

7

$$-5x = 10$$

$$\begin{array}{r} -2 - 5 \\ -7 \end{array}$$

$$x = \cancel{-2}$$

no soln.

ex 38  $\left(\sqrt[3]{p+5}\right)^3 = \left(\sqrt[3]{2p-4}\right)^3$

$$\begin{array}{r} p + \cancel{5} = \cancel{2p} - 4 \\ -2p - \cancel{5} \quad -2p - 5 \end{array}$$

$$\sqrt[3]{14}$$

$$\sqrt[3]{14}$$

$$-p = -9$$

$$p = 9$$

ex 42  $\left(\sqrt[3]{2k-11}\right)^3 = \left(\sqrt[3]{5k+1}\right)^3$

$$\begin{array}{r} 2k - 11 = 5k + 1 \\ -5k + 11 \quad -5k + 11 \end{array} \quad \sqrt[3]{-19}$$

$$\sqrt[3]{-19}$$

$$-3k = 12$$

$$k = -4$$

ex 52  $\frac{\sqrt{3x-2} - \sqrt{x+3}}{\sqrt{x+3}} = 1$

$$\left(\sqrt{3x-2}\right)^2 = \left(1 + \sqrt{x+3}\right)\left(1 + \sqrt{x+3}\right)$$

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

$$\begin{array}{r} 3x - 2 = 4 + 2\sqrt{x+3} + x \\ -x - 4 \quad -4 \quad -x \end{array}$$

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

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

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

$$\begin{array}{r} x^2 - 6x + 9 = x + 3 \\ -x \quad -3 \quad -x - 3 \end{array}$$

$$x^2 - 7x = -6$$

$$x^2 - 7x + 6 = 0$$

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

$$x-6=0 \text{ or } x-1=0$$

$$x=6 \text{ or } x=1$$



ex 64  $(r)^2 = \left( \sqrt{\frac{A}{\pi}} \right)^2$  solve for A

$$r^2 = \frac{A}{\pi}$$

$$\pi \cdot r^2 = \frac{A}{\cancel{\pi}} \cdot \cancel{\pi}$$

$$\pi r^2 = A$$

ex 66  $(V)^2 = \left( \sqrt{\frac{2K}{m}} \right)^2$  solve for m

$$m \cdot V^2 = \frac{2K}{m} \cdot m \quad \frac{m}{\cancel{V^2}} \cdot \cancel{V^2} = \frac{2K}{\cancel{m}} \cdot \frac{\cancel{V^2}}{V^2}$$

$$\frac{m V^2}{V^2} = \frac{2K}{V^2}$$

$$m = \frac{2K}{V^2}$$

$$m = \frac{2K}{V^2}$$