

10.1 Find all the square roots
 p. 658 ex 12 16 $()^2 = 16$
 4 & -4

ex 16 225 15 & -15

ex 18 $\frac{81}{400}$ $\frac{9}{20}$ & $-\frac{9}{20}$

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ex 22 $\sqrt{4} = 2$ because $2 \cdot 2 = 4$ $\sqrt{\quad}$ radical

ex 28 $-\sqrt{64} = -8$

ex 30 $-\sqrt{196} = -14$

ex 32 $-\sqrt{\frac{49}{36}} = -\frac{7}{6}$

ex 34 $\sqrt{0.16} = \textcircled{.4}$
 $(.04)(.04) = .0016$, not .16

ex 36 $\sqrt{-64}$ not a real number

ex 38 $-\sqrt{-100}$ not a real number

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ex 72 $-\sqrt{121} = -11$ $\sqrt{\quad}$
ex 74 $\sqrt[3]{343} = 7$ because $(7)^3 = 343$
 $\sqrt[3]{\boxed{\quad}} 343 = \boxed{\quad}$
ex 76 $\sqrt[3]{-125} = -5$ $(-5)^3 = -125$
 if the index is odd, we can take the root of a negative number
 even index \rightarrow not a real #
ex 78 $-\sqrt[3]{1000} = -10$
ex 80 $\sqrt[4]{625} = 5$ because $5^4 = 625$
ex 88 $\sqrt[8]{-1}$ not real
ex 92 $\sqrt[4]{\frac{81}{16}} = \frac{3}{2}$
ex 94 $-\sqrt[5]{\frac{1}{22}} = -\frac{1}{2}$
ex 96 $-\sqrt[3]{-64} = -(-4) = 4$
ex 100 $-\sqrt{0.81} = -.9$ or -0.9

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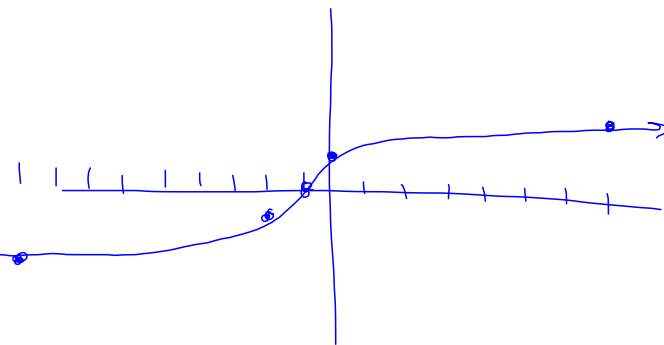
ex 104 $f(x) = \sqrt{x-5}$

x	y = f(x)
5	$\sqrt{0} = 0$
6	$\sqrt{1} = 1$
7	$\sqrt{2} \approx 1.4$
9	$\sqrt{4} = 2$
14	$\sqrt{9} = 3$

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ex 110 $f(x) = \sqrt[3]{x+1}$

x	y = f(x)
-9	$\sqrt[3]{-8} = -2$
-2	$\sqrt[3]{-1} = -1$
-1	$\sqrt[3]{0} = 0$
0	$\sqrt[3]{1} = 1$
7	$\sqrt[3]{8} = 2$



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ex 112 $\sqrt{19^2} = 19$

ex 122 $-\sqrt{x^2} = -x$

ex 114 $\sqrt{(-13)^2} = 13$

ex 124 $\sqrt{(-9)^2} = 9$

ex 116 $\sqrt[6]{(-4)^6} = 4$

ex 126 $-\sqrt[3]{x^3} = -x$

ex 118 $\sqrt[5]{(-8)^5} = -8$

ex 128 $\sqrt[3]{m^9} = m^3$

$()^3 = m^9$

$() () () = m^9$

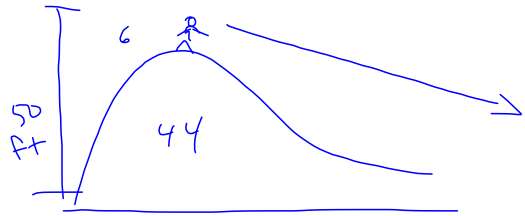
ex 130 $\sqrt[4]{k^{20}} = k^5$

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ex 147

$$D = \sqrt{2H}$$

$$\begin{aligned} D &= \sqrt{2 \cdot 50} \\ &= \sqrt{100} \\ &= 10 \text{ miles} \end{aligned}$$



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ex 149

$$A = \sqrt{s(s-a)(s-b)(s-c)}$$

$$s = \frac{1}{2}(a+b+c)$$

$$\begin{aligned} a &= 850 \text{ mi} \\ b &= 925 \text{ mi} \\ + c &= 1300 \text{ mi} \\ \hline &3075 \text{ mi} \end{aligned}$$

$$s = 1537.5 \text{ mi}$$

$$\begin{aligned} A &= \sqrt{1537.5(1537.5-850)(1537.5-925)(1537.5-1300)} \\ &= \sqrt{1537.5(687.5)(612.5)(237.5)} \\ &= \sqrt{153,765,014,648.4375} \\ &= 392,128 \text{ or } 392,000 \text{ sq. miles} \end{aligned}$$

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10.2
p 668

$$a^{\frac{1}{r}} = \sqrt[r]{a}$$

$$a^{\frac{p}{r}} = \sqrt[r]{a^p} \text{ or } (\sqrt[r]{a})^p$$

ex 11

$$169^{\frac{1}{2}} = \sqrt{169} = 13$$

ex 14

$$512^{\frac{1}{3}} = \sqrt[3]{512} = 8$$

ex 16

$$625^{\frac{1}{4}} = \sqrt[4]{625} = 5$$

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ex 18 $\left(\frac{8}{27}\right)^{\frac{1}{3}} = \sqrt[3]{\frac{8}{27}} = \frac{2}{3}$

ex 20 $(-32)^{\frac{1}{5}} = \sqrt[5]{-32} = -2$

ex 22 $(-36)^{\frac{1}{2}} = \sqrt{-36} \text{ not real}$

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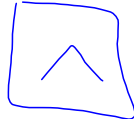
ex 24

$$64^{3/2} = \sqrt{64^3} \text{ or } (\sqrt{64})^3$$

$$= 512$$

ex 26

$$216^{2/3} = \left(\sqrt[3]{216}\right)^2 = 36$$



$$216 \quad \square \quad (2 \div 3) \quad \square =$$

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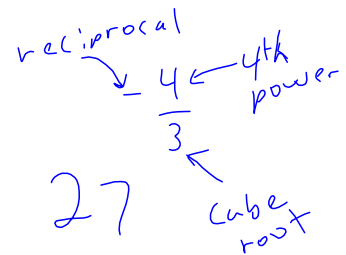
ex 32

$$27^{-4/3} = \left(\sqrt[3]{27}\right)^{-4}$$

or

$$\frac{1}{\left(\sqrt[3]{27}\right)^4}$$

$$= \frac{1}{81}$$



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ex 34 $81^{-3/2} = (\sqrt{81})^{-3} = \frac{1}{(\sqrt{81})^3}$
 $= \frac{1}{729}$

ex 36 $\left(\frac{64}{125}\right)^{-2/3} = \left(\sqrt[3]{\frac{64}{125}}\right)^{-2} = \left(\frac{4}{5}\right)^{-2}$
 $= \left(\frac{16}{25}\right)^{-1} = \frac{25}{16}$ ← $\left(\frac{5}{4}\right)^2$

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ex 40 $3^{1/2} = \sqrt{3}$

ex 42 $7^{2/3} = \left(\sqrt[3]{7}\right)^2$ or $\sqrt[3]{7^2}$

ex 44 $(3p)^{3/4} + (4x)^{1/3} =$
 or $\left(\sqrt[4]{3p}\right)^3 + \sqrt[3]{4x}$
 $\sqrt[4]{(3p)^3} + \sqrt[3]{4x}$

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$$\underline{\text{ex52}} \quad \sqrt{5^{10}} = 5^{10/2} = 5^5 = 3125$$

$$\underline{\text{ex54}} \quad \sqrt[4]{6^8} = 6^{8/4} = 6^2 = 36$$

$$\underline{\text{ex56}} \quad \sqrt{r^{50}} = r^{50/2} = r^{25}$$

$$\underline{\text{ex58}} \quad \sqrt[4]{y} \cdot \sqrt[5]{y^2} = y^{1/4} \cdot y^{2/5} = y^{5/20} \cdot y^{8/20} \\ = y^{13/20}$$

$$\underline{\text{ex60}} \quad \frac{\sqrt[4]{w^3}}{\sqrt[6]{w}} = \frac{w^{3/4}}{w^{1/6}} = \frac{w^{9/12}}{w^{2/12}} = w^{7/12}$$

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