

10.1 p.607 Find all square roots of...

ex 8 $\sqrt{16} = 4$ or -4
 radical what # times itself is 16

ex 10 $\sqrt{100} = 10$ or -10

ex 12 $\sqrt{225} = 15$ or -15

ex 14 $\sqrt{\frac{81}{400}} = \frac{9}{20}$ or $-\frac{9}{20}$

ex 16 $\sqrt{1600} = 40$ or -40

$$\underline{\text{ex 18}} \quad \sqrt{4} = 2$$

$$\textcircled{-\sqrt{4}} = \textcircled{-2}$$

$$\underline{\text{ex 22}} \quad -\sqrt{196} = -14$$

$$\pm\sqrt{4} = \pm 2$$

$$\underline{\text{ex 24}} \quad -\sqrt{\frac{49}{36}} = -\frac{7}{6}$$

$$(.4)^2 = .16$$

$$\underline{\text{ex 26}} \quad \sqrt{0.16} = 0.4$$

$$(.04)^2 = 0.0016$$

$$\underline{\text{ex 28}} \quad \sqrt{-64} \quad \text{not real}$$

$$(\quad)^2 = -64$$

$$\text{but } -\sqrt{64} = -8$$

Find the square of ...

ex 32 $\sqrt{59}$ so $\sqrt{59} \cdot \sqrt{59} = 59$
 radical radicand

$(\sqrt{4})^2 = \sqrt{4} \cdot \sqrt{4} = \sqrt{16}$
 $= 2 \cdot 2 = 4$

$(\sqrt{16})^2 = \sqrt{16} \cdot \sqrt{16} = \sqrt{256}$
 $= 4 \cdot 4 = 16$

ex 34 $(-\sqrt{59})^2 = (-\sqrt{59})(-\sqrt{59}) = 59$

ex 36 $(\sqrt{\frac{5}{7}})^2 = \sqrt{\frac{5}{7}} \cdot \sqrt{\frac{5}{7}} = \frac{5}{7}$
 $\downarrow \sqrt{\frac{25}{49}}$

ex 38 $(\sqrt{9y^2 + 3})^2 = 9y^2 + 3$

Rational, Irrational or not real

ex 44 $\sqrt{169} = 13$. rational

ex 46 $\sqrt{33}$ ← irrational → $2\sqrt{5}$ 5.745

ex 48 $-\sqrt{81} = -9$ rational

ex 50 $-\sqrt{500}$ irrational - 22.361

ex 52 $\sqrt{-47}$ not real

ex 56 $\sqrt{43}$

$$\textcircled{6} = \sqrt{\frac{6^2}{36}} = \sqrt{43} < \sqrt{\frac{7^2}{49}} = \textcircled{7}$$

ex 58

$$\sqrt{25} < \sqrt{30} < \sqrt{36}$$

5 & 6

ex 60

$$-\sqrt{64} < -\sqrt{63} < -\sqrt{49}$$

-8 & -7

ex 68 $-\sqrt{121} = -11$

ex 70 $\overset{\text{index}}{\nearrow} \sqrt[3]{343} \rightarrow (7)^3 = 343$

\sqrt{x} \sqrt{x}

$3 \sqrt{343} = \text{enter}$

$$\underline{\text{ex 72}} \quad \sqrt[3]{-125} = \textcircled{-5} \text{ because } (-5)(-5)(-5) = -125$$

$$\underline{\text{ex 76}} \quad \sqrt[4]{625} = 5 \quad 5 \cdot 5 \cdot 5 \cdot 5 = 625$$

$$\underline{\text{ex 80}} \quad \sqrt[4]{-256} \text{ not real}$$

$$\underline{\text{ex 84}} \quad \sqrt[8]{-1} \text{ not real}$$

$$\underline{\text{ex 88}} \quad \sqrt[4]{\frac{81}{16}} = \frac{\sqrt[4]{81}}{\sqrt[4]{16}} = \frac{3}{2}$$

$$\underline{\text{ex 92}} \quad = \sqrt[3]{-64} = \text{---}(-4) = 4$$

$$\underline{\text{ex 94}} \quad \sqrt{.36} = .6$$

$$\underline{\text{ex 98}} \quad \sqrt[3]{0.125} = 0.5$$

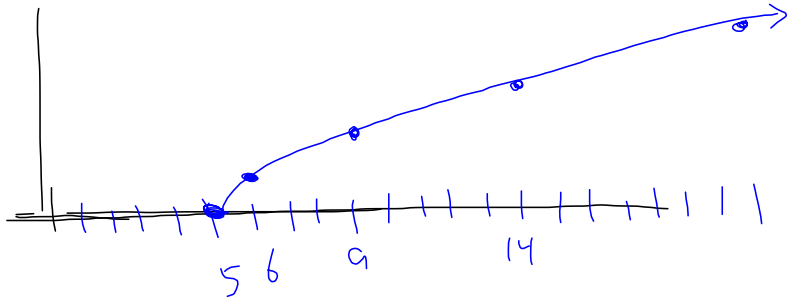
$$\frac{1}{8} \qquad \frac{1}{2}$$

ex 100

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

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

x	y
5	0
6	1
9	2
14	3
21	4

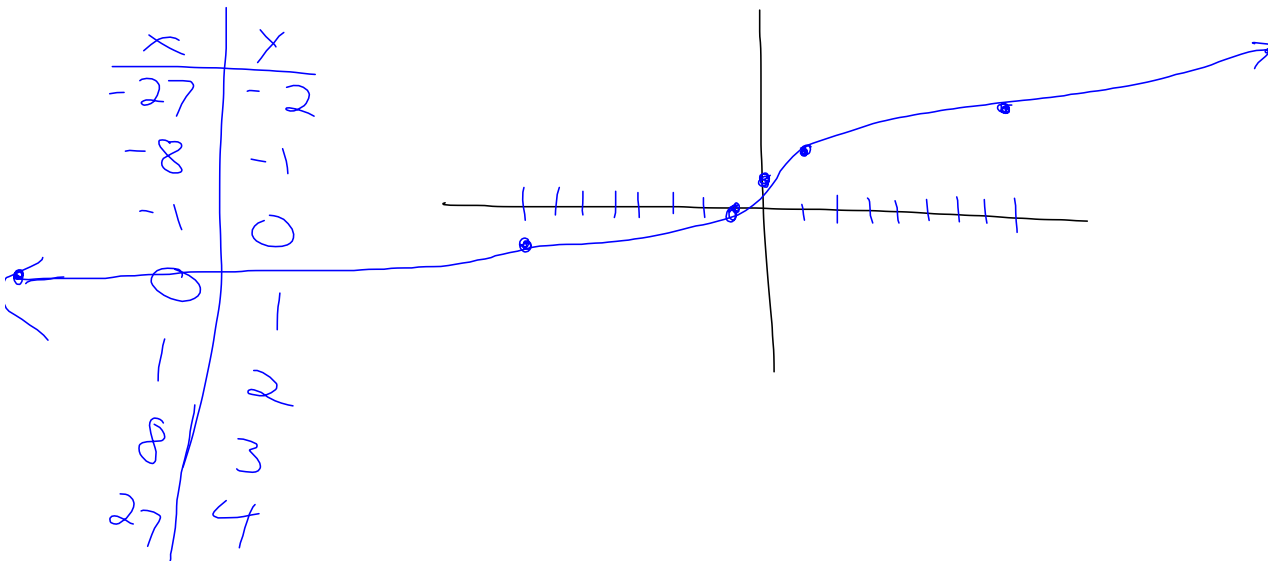


ex 104

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

$$y = \sqrt[3]{x} + 1$$

x	y
-27	-2
-8	-1
-1	0
0	1
8	2
27	3



10.2 p. 617

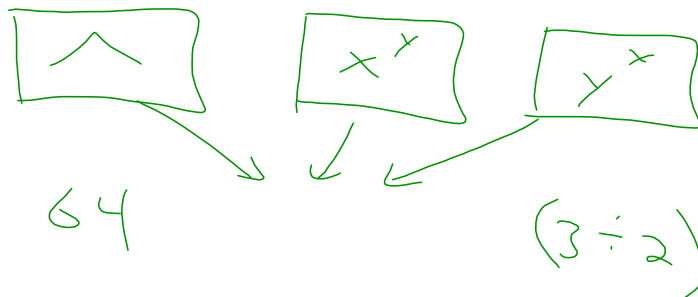
ex 12 $121^{\frac{1}{2}} = \sqrt{121} = 11$

ex 14 $512^{\frac{1}{3}} = \sqrt[3]{512} = 8$

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 24 $64^{\frac{3}{2}}$ ^{3 power} _{root =} $\sqrt{64^3} = (\sqrt{64})^3 = 8^3 = 512$



$64^{\frac{4}{3}} = (\sqrt[3]{64})^4 = 4^4 = 256$

$(3 \div 2)$
1.5

ex 30 $(-243)^{\frac{2}{5}} = \left(\sqrt[5]{-243}\right)^2 = 9$

but

$$-243^{\frac{2}{5}} = -9$$

means

$$-1 \cdot 243^{\frac{2}{5}}$$

ex 34

81 $\frac{3}{2}$
 ↑ ← power
 ↓ ← root
 take reciprocal

$$\frac{1}{4} = .25 = \left(\sqrt[2]{81}\right)^{-3}$$

$$= 9^{-3}$$

$$\left(\frac{1}{4}\right)^{-1} = (.25)^{-1} = 4 = \frac{1}{729}$$

$$3^2 = 9$$

$$3^1 = 3$$

$$3^0 = 1$$

$$3^{-1} = \frac{1}{3}$$

$$3^{-2} = \frac{1}{9} = \frac{1}{3^2}$$

ex 36

$$\left(\frac{64}{125}\right)^{-\frac{2}{3}} = \left(\sqrt[3]{\frac{64}{125}}\right)^{-2}$$

$$= \left(\frac{4}{5}\right)^{-2} = \left(\frac{16}{25}\right)^{-1} = \frac{25}{16}$$

ex 38

$$\left(\frac{729}{64}\right)^{-\frac{5}{6}}$$

$$= \left(\sqrt[6]{\frac{729}{64}}\right)^{-5} = \left(\frac{3}{2}\right)^{-5}$$

$$= \frac{3^{-5}}{2^{-5}} = \frac{32}{243}$$