

# Review

## 1. Rational

$$\sqrt{4}, \frac{2}{3}, 8.23, \sqrt{\frac{64}{121}}, -\sqrt{0.81}, 0.75$$

## Irrational

$$\sqrt[3]{85}, \sqrt[4]{32}, 6.2312311\dots, \sqrt[3]{\frac{16}{25}}$$

2.  $\sqrt{36} = 6$  and  $\sqrt{49} = 7$

$\sqrt[3]{64} = 4$  and  $\sqrt[3]{125} = 5$

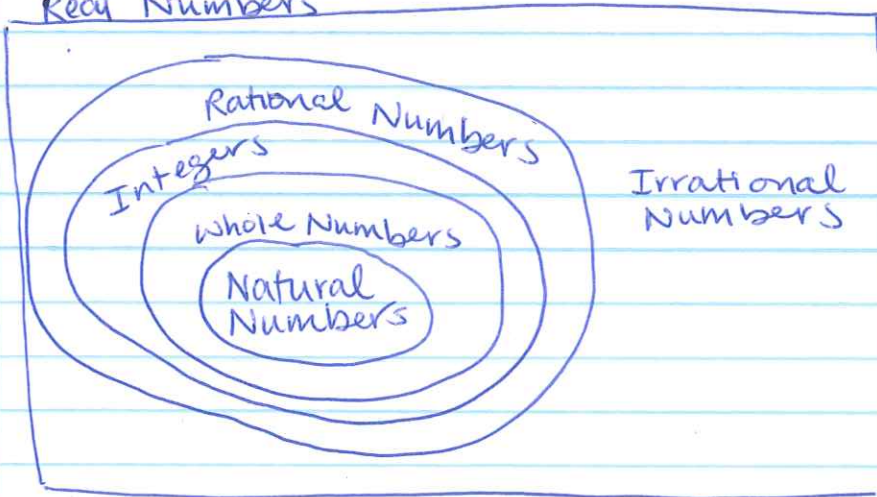


a)  $\sqrt{45} \approx 6.7$

b)  $\sqrt[3]{75} \approx 4.2$

3.  $\sqrt[3]{-50}, \sqrt{\frac{1}{3}}, \sqrt[3]{\frac{4}{5}}, \sqrt[4]{12}, \sqrt{22}$   
Rat. Numbers

4.



5a)  $\sqrt{45} = 3\sqrt{5}$

b)  $\sqrt[3]{256}$   
 $= \sqrt[3]{8 \cdot 32}$   
 $= \sqrt[3]{8 \cdot 8 \cdot 4}$   
 $= 4\sqrt[3]{4}$

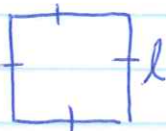
c)  $\sqrt[4]{1250}$   
 $= \sqrt[4]{10 \cdot 125}$   
 $= \sqrt[4]{2 \cdot 5 \cdot 5 \cdot 5 \cdot 5}$   
 $= 5\sqrt[4]{2}$

6a)  $6\sqrt{5} = \sqrt{180}$

b)  $3\sqrt[3]{2} = \sqrt[3]{54}$

c)  $2\sqrt[4]{9} = \sqrt[4]{144}$

7a)



$$l^2 = 252$$

$$l = \sqrt{252}$$

$$= \sqrt{2 \cdot 126}$$

$$= \sqrt{2 \cdot 2 \cdot 63}$$

$$= 2 \cdot 3\sqrt{7}$$

$$= 6\sqrt{7} \text{ ft}$$

b)  $P = 4l$   
 $= 24\sqrt{7} \text{ ft}$

$$\begin{aligned}
 8. \quad a^3 &= a \cdot a \cdot a \quad \downarrow \times \frac{1}{a} \\
 a^2 &= a \cdot a \quad \downarrow \times \frac{1}{a} \\
 a^1 &= a \quad \downarrow \times \frac{1}{a} \\
 a^0 &= 1 \quad \downarrow \times \frac{1}{a} \\
 a^{-1} &= \frac{1}{a} \quad \downarrow \times \frac{1}{a} \\
 a^{-2} &= \frac{1}{a \cdot a} = \frac{1}{a^2}
 \end{aligned}$$

$$\begin{aligned}
 9a) \quad 16^{1/2} &= \sqrt{16} = 4 \\
 b) \quad 8^{4/3} &= (\sqrt[3]{8})^4 = (2)^4 = 16 \\
 c) \quad -\left(\frac{4}{25}\right)^{3/2} &= -\left(\sqrt{\frac{4}{25}}\right)^3 = -\left(\frac{2}{5}\right)^3 = -\frac{8}{125} \\
 d) \quad 0.36^{3/2} &= \left(\sqrt{\frac{36}{100}}\right)^3 = \left(\frac{6}{10}\right)^3 = \left(\frac{3}{5}\right)^3 = \frac{27}{125}
 \end{aligned}$$

$$10a) \quad \sqrt{8^3} = 8^{3/2} \quad b) \quad (\sqrt[3]{-1.5})^2 = (-1.5)^{2/3} \quad c) \quad \left(\sqrt{\frac{1}{8}}\right)^5 = \left(\frac{1}{8}\right)^{5/2}$$

$$\begin{aligned}
 11. \quad 1.96^{3/2} &= (\sqrt{1.96})^3 \\
 &= (1.4)^3 \\
 &= 2.744
 \end{aligned}$$

$$\begin{aligned}
 12f) \quad 32^{-0.4} &= \left(\frac{1}{32}\right)^{4/10} = \left(\frac{1}{32}\right)^{2/5} \\
 &= \left(\sqrt[5]{\frac{1}{32}}\right)^2 = \left(\frac{1}{2}\right)^2 = \frac{1}{4}
 \end{aligned}$$

$$\begin{aligned}
 12a) \quad 4^{-1/2} &= \frac{1}{4^{1/2}} = \frac{1}{\sqrt{4}} = \frac{1}{2} \\
 b) \quad (-7)^{-2} &= \frac{1}{(-7)^2} = \frac{1}{49} \\
 c) \quad \left(\frac{1}{5^{-3}}\right) &= 5^3 = 125 \\
 d) \quad (-0.027)^{-2/3} &= \left(\sqrt[3]{\frac{-27}{1000}}\right)^{-2} = \left(\frac{-3}{10}\right)^{-2} = \left(\frac{-10}{3}\right)^2 = \frac{100}{9} \\
 e) \quad \left(\frac{-64}{125}\right)^{-5/3} &= \left(\frac{-125}{64}\right)^{5/3} = \left(\sqrt[3]{\frac{-125}{64}}\right)^5 = \left(\frac{-5}{4}\right)^5 = -\frac{3125}{1024}
 \end{aligned}$$

$$\begin{aligned}
 13a) \quad (a^5 b)(a^4 b^{-9}) &= a^9 b^{-8} = \frac{a^9}{b^8} \\
 b) \quad \left(\frac{a^2}{b^3}\right)^{-4} &= \left(\frac{b^3}{a^2}\right)^4 = \frac{b^{12}}{a^8} \\
 c) \quad (3x^{-2}y^4z)^3 &= 27x^{-6}y^{12}z^3 = \frac{27y^{12}z^3}{x^6} \\
 d) \quad -\frac{9a^{-4}b^{3/4}}{3a^2b^{1/4}} &= -\frac{3a^{-4}b^{3/4}}{a^2b^{1/4}} = -3a^{-6}b^{2/4} = -\frac{3b^{1/2}}{a^6}
 \end{aligned}$$

$$\begin{aligned}
 e) \quad \left(-\frac{3}{8}\right)^{2/3} \cdot \left(-\frac{3}{8}\right)^{-1/3} &= \left(-\frac{3}{8}\right)^{1/3} \\
 f) \quad \left(\frac{-64a^6}{b^{-9}}\right)^{1/3} &= \frac{\sqrt[3]{-64a^6}}{b^{-3}} = -\frac{4a^2}{b^3}
 \end{aligned}$$

$$14. \quad \left(\frac{5a^2}{b^{1/2}}\right)^{-2} = \frac{5^{-2}a^{-4}}{b^{-1}} = \frac{b}{25a^4}$$