

8.2 Rational Exponents

(No Calculator) - Exercises 3-8all, 11-59eoo, 61-89eoo

$$1. a. 32^{1/5} \Rightarrow \sqrt[5]{32} \Rightarrow 2$$

$$b. 64^{1/2} \Rightarrow \sqrt[2]{64} \Rightarrow 8$$

$$c. -81^{1/4} \Rightarrow -\sqrt[4]{81} \Rightarrow -3$$

$$d. (-81)^{1/4} \Rightarrow \sqrt[4]{-81} \Rightarrow \sqrt[4]{-1} \sqrt[4]{81} = \text{NOT Real}$$

$$e. 5x^{3/5} - (2x)^{3/5}$$

$$5\sqrt[5]{x^3} - \sqrt[5]{(2x)^3} \Rightarrow 5\sqrt[5]{x^3} - \sqrt[5]{8x^3}$$

CAUTION: p388

$$\bullet 16^{-1/4} = \frac{1}{16^{1/4}} = \frac{1}{\sqrt[4]{16}} = \frac{1}{2}$$

$$\bullet -16^{1/4} = -\sqrt[4]{16} = -2$$

$$\bullet -16^{-1/4} = -\frac{1}{16^{1/4}} = -\frac{1}{2}$$

8.7

COMPLEX NUMBERS

$$\begin{aligned}
 \sqrt{-1} &= i^1 = (\sqrt{-1}) & i \\
 i^2 &= (\sqrt{-1})(\sqrt{-1}) & = -1 \\
 i^3 &= i \cdot i^2 & = -i \\
 i^4 &= (i^2)^2 = (-1)^2 & = 1 \\
 i^5 &= i \cdot i^4 & = i \\
 i^6 &= i^2 \cdot i^4 & = -1
 \end{aligned}$$

8.7 Complex Numbers

Exercises - 1-6, 8,10,14,16,22,32,40,44,50,52,56,62,64,68,70,76

$$\begin{aligned}
 2. \quad -\sqrt{-1} &= -i \\
 4. \quad -i^2 &= -(-1) = 1 \\
 6. \quad (-i)^2 &= (-i)(-i) = +i^2 = +(-1) = -1 \\
 9. \quad -\sqrt{-144} &= -\sqrt{144} \sqrt{-1} = -12i
 \end{aligned}$$