

CHAPTER 9

Powers and Roots

9.1 Rational Exponents and Radicals

- 1) $16^{-1} = \frac{1}{16}$
 $16^0 = 1$
 $16^1 = 16$
a) $16^0 < 16^{1/2} < 16^1 \rightarrow 1 < 16^{1/2} < 16$
b) $16^{1/2} = \sqrt{16}$
d) One equation only has two solutions while the other only has one.
- 3)
a) Index = 3, Radical is the $\sqrt{\quad}$ symbol, Radicand = 27
b) $\sqrt[3]{27} = 27^{1/3}$
c) $3^3 = 27$ so $\sqrt[3]{27} = 3$
- 5) 2
- 7)
a) $\sqrt[6]{10} \approx 1.468$
b) There is no exact “friendly number” whose sixth power equals 10.
- 9) 8
- 11)
a) $2 \sqrt[4]{3}$
b) $\sqrt[3]{5}$
c) $\sqrt[6]{7}$
d) $\frac{9\sqrt{6}}{8}$
- 13)
a) $x = \pm 4\sqrt{3}$
b) $x = 3 \pm \sqrt{6}$
c) $x = \frac{1}{2} \pm \frac{\sqrt{11}}{2}$
d) $x = -3 \pm 2\sqrt{7}$
- 15) $12\sqrt{2}$
- 17) $c = -3$ or $c = -5$
- 19)
a) $x = \frac{5}{2} = 2.5$ or $x = 3$