

Selected Solutions from Radicals and Rational Exponents handout,
Sections B.5 and 2.1

Radicals and Rational Exponents

1.

(a) $20^{1/3}$

(b) $x^{3/2}$

(c) $m^{2/5}$

(d) $x^{7/5}y^{2/5}z^2$

(e) $3^{3/2}m^{3/2}n^{3/2}$

(f) $2^5x^{10/3}y^{5/3}$

2.

(a) $\frac{1}{x^{1/3}}$

(b) $\frac{1}{2^{3/4}r^{3/4}s^{3/4}}$

(c) $x^{2/3}$

(d) $\frac{3}{5}m^{1/2}$

(e) $10^{2/3}$

(f) $8^{3/4}$

3.

(a) no simplification necessary

(b) $7^{1/4}$

(c) $x^{17/12}$

(d) $x^{2/7}$

(e) $m^{1/6}n^{1/8}$

(f) $a^4b^{3/2}$

4.

(a) $\sqrt[3]{a^2}$

(b) $2y^2$

(c) $x^2|y^3|$

(d) $2|s|\sqrt{|y|}$

(e) $\frac{m^2n^4}{2}$

(f) $\frac{x^3y^4}{2}$

5.

(a) $2^{1/3}x^{5/6}$

(b) $3^{1/5}y^{8/15}$

(c) $x^{12}y^7$

(d) $x^{10}(y+1)^{11}$

(e) $a^{13}b^{11}c^{18}$

6.

(a) $a + \sqrt{2a} + \sqrt{3a} + \sqrt{6}$

(b) $a^2 + 2a\sqrt{b} + b$

(c) $(|x| - 3)\sqrt{x - 1}$

(d) $x^2 - 2x\sqrt{y} + y$

(e) $2(\sqrt{2} - 1)$

(f) $\frac{a^2b^2}{a+b}$

B.5

6) $\frac{1}{x^2}$

14) $\frac{2a-1}{ax}$

24) $\frac{20}{(x-4)(x+1)}$

30) $\frac{a^2+2ax-x^2}{(x+a)(a-x)}$

38) $2 - a$

40) $\frac{b+a}{b-a}$

42) $\frac{y-x}{xy}$

44) $\frac{-3}{x^2(x^2+h)}$

46) $\frac{(x+y)(x-2y)}{x}$

50) $\frac{a^2}{a+1}$

52) $\frac{1}{2}$

2.1

2) $x = 3 + \sqrt{11}, x = 3 - \sqrt{11}$

6) $y = \frac{3+\sqrt{57}}{6}, y = \frac{3-\sqrt{57}}{6}$

12) $x = -1, x = 9$

14) $x = 1 + \sqrt{17}, x = 1 - \sqrt{17}$

30) sum 3, product 12

34) $x^2 + 13x + 36 = 0$

36) $x^2 - 4x - 1 = 0$

44) no real number roots

46) one real root

54) $k = 4$

56) $y = \frac{-\pi x \pm \sqrt{\pi(\pi x^2 + 96)}}{4\pi}$

Additional Problems (from 2.1):

1. neither, $x = -8$

2. quadratic, $x = 0, x = 5$
 3. neither, $x = \frac{9}{1-3a}$
 4. quadratic, $x = \frac{7+\sqrt{33}}{2}, x = \frac{7-\sqrt{33}}{2}$
 5. neither, $x = 6, x = -1$
 6. linear, $x = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{5}-\sqrt{2}}$
 7. see #4
 8. linear, $x = \frac{\pi}{1+\pi^2}$
 9. quadratic $x = 2 + \sqrt{13}, x = 2 - \sqrt{13}$
 10. quadratic $x = -2 + \sqrt{6}, x = -2 - \sqrt{6}$
 11. quadratic $x = \frac{-1+\sqrt{33}}{8}, x = \frac{-1-\sqrt{33}}{8}$
 12. quadratic $x = \sqrt{5}, x = 7 + \sqrt{5}$
- 11 (on back)
- (a) $(x + \frac{1}{2})(x - 2) = 0$
 - (b) $(x - a)(x - 3a) = 0$
 - (c) $(x + 1)(x - 101) = 0$
 - (d) $\frac{1}{100}x^2 - \frac{101}{100}x + 1 = 0$