

Name: \_\_\_\_\_

## Radical Functions

**Exercise 1:** Write the following expressions using only positive integer exponents and radicals.

- 1)  $4^{1/5}$
- 2)  $\left(\frac{4}{7}\right)^{2/5}$
- 3)  $3^{-3/2}$
- 4)  $100^{0.1}$

**Exercise 2:** Let  $a$  and  $b$  stand for any numbers. Write the following expressions using only positive integer exponents and radicals.

- 1)  $a^{1/2}$
- 2)  $(a+b)^{-1/2}$
- 3)  $2a^{-1/2} + 3b^{-1/2}$

**Exercise 3:** Calculate the number of units of output  $Q$  of a firm when its production function is given by  $Q = 100K^{1/3}L^{1/2}$ , where  $K$  and  $L$  are, respectively, the amount of capital and labor that are invested in the production process

- 1) when  $K = 27$  and  $L = 100$ .
- 2) when  $K = 100$  and  $L = 27$ .

**Exercise 4:** The time  $t$ , it takes in seconds for an object to fall  $d$  feet is given by the equation  $t = \frac{1}{4}\sqrt{d}$ . The Sears Tower in Chicago is 1450 feet tall. How long would it take a penny to fall from the top of the Sears Tower?**Exercise 5:** Are there numbers with both a positive and a negative fourth root? If so, give an example. If not, explain why not.**Exercise 6:** Are there any numbers for which the second, third, fourth, fifth, and sixth roots are the same number? If so, list them.**Exercise 7:** Find the domain of definition

- |   |                         |
|---|-------------------------|
| 1) $f(x) = \sqrt{-2x+4}$                      | 2) $f(x) = \sqrt{x+3}$  |
| 3) $f(x) = \sqrt{-2x+\sqrt{2}}$               | 4) $f(x) = \sqrt{-x-2}$ |
| 5) $f(x) = \sqrt{3-9x}$                       | 6) $f(x) = \sqrt{5x+1}$ |
| 7) $f(x) = \sqrt{\frac{1}{2}x + \frac{3}{2}}$ | 8) $f(x) = \sqrt{3x-2}$ |