Name: **Course/Section:** **Instructor:**

Chapter 7 Radical Expressions and Functions
7.1 Radical Expressions and Functions

Radical Notation ~ The Square Root Function ~ The Cube Root Function

STUDY PLAN

Read: Read Section 7.1 on pages 492-500 in your textbook or eText.

Practice: Do your assigned exercises in your ☐ Book ☐ MyMathLab ☐ Worksheets

Review: Keep your corrected assignments in an organized notebook and use them to review for the test.

Key Terms

Exercises 1-8: Use the vocabulary terms listed below to complete each statement. Note that some terms or expressions may not be used.

radicand	***n*th root**
cube root	**index**
radical sign	**even root**
odd root	**square root**
radical expression	**principal *n*th root**

1. The symbol $\sqrt{\ }$ is called the _____.

2. The _____ function is given by $f(x) = \sqrt[3]{x}$.

3. If $a > 0$ and n is even, then the positive nth root is denoted $\sqrt[n]{a}$ and is called the _____ of a.

4. An expression containing a radical sign is called a(n) _____.

5. The _____ function is given by $f(x) = \sqrt{x}$.

6. The number b is a(n) _____ of a if $b^n = a$.

7. The equation $\sqrt[n]{a} = b$ means that $b^n = a$, where n is a natural number called the _____. If n is odd, we are finding a(n) _____ and if n is even, we are finding a(n) _____

8. The expression under the radical sign is called the _____.

Radical Notation

Exercises 1-19: Refer to Examples 1-7 on pages 492-496 in your text and the Section 7.1 lecture video.

1. Find the square roots of 144. **1.** _____

Evaluate each square root.

2. $\sqrt{64}$ **2.** _____

3. $\sqrt{0.36}$ **3.** _____

4. $\sqrt{\frac{16}{25}}$ **4.** _____

5. $\sqrt{d^2},\ d < 0$ **5.** _____

6. Approximate $\sqrt{19}$ to the nearest thousandth. **6.** _____

7. A formula for calculating the distance d in miles that one can see to the horizon on a clear day is approximated by $d = 1.22\sqrt{x}$, where x is the elevation, in feet, of person.

(a) Approximate how far a 5.75-foot-tall person can see to the horizon. **7.(a)**_____

(b) Approximate how far a person can see from a 9500-foot mountain. **(b)**_____

Evaluate the cube root. Approximate your answer to the nearest hundredth when appropriate.

8. $\sqrt[3]{27}$ **8.** _____

9. $\sqrt[3]{-64}$ **9.** _____

10. $\sqrt[3]{\frac{1}{8}}$ **10.** _____

11. $\sqrt[3]{a^{12}}$ **11.** _____

12. $\sqrt[3]{12}$ **12.** _____

Evaluate each root, if possible.

13. $\sqrt[4]{625}$ **13.** _____

14. $\sqrt[5]{-243}$ **14.** _____

15. $\sqrt[4]{-16}$ **15.** _____

16. $-\sqrt[4]{16}$ **16.** _____

Write each expression in terms of an absolute value.

17. $\sqrt{z^2}$ **17.** _____

18. $\sqrt{(x-2)^2}$ **18.** _____

19. $\sqrt{x^2+6x+9}$ **19.** _____

The Square Root Function

Exercises 20-26: Refer to Examples 8-12 on pages 496-499 in your text and the Section 7.1 lecture video.

If possible, evaluate $f(1)$ **and** $f(-2)$ ***for each*** $f(x)$**.**

20. $f(x)=\sqrt{4x-3}$ **20.** _____

_____

21. $f(x)=\sqrt{13-x^2}$ **21.** _____

_____

22. If a football is kicked x feet high, then the time T in seconds that the ball is in the air is given by the function

$T(x)=\dfrac{\sqrt{x}}{2}$.

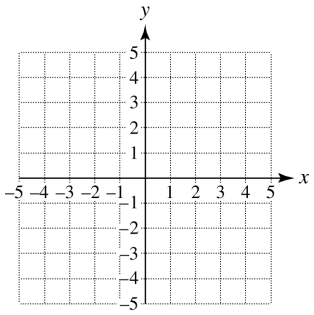
(a) Find the hang time if the ball is kicked 30 feet into the air. **22.(a)**_____

(b) Does the hang time triple if the ball is kicked 90 feet into the air? **(b)**_____

23. Let $f(x)=\sqrt{x-3}$.

(a) Find the domain of f. Write your answer in interval notation. **23.(a)**_____

(b) Graph $y=f(x)$ and compare it to the graph of $y=\sqrt{x}$. **(b)**_____

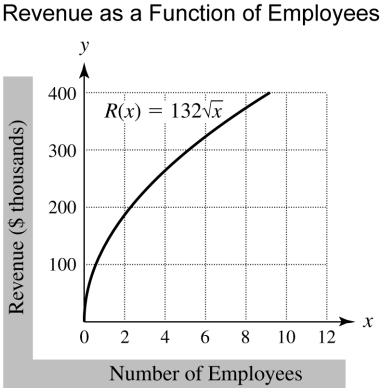


Find the domain of each function. Write your answer in interval notation.

24. $g(x)=\sqrt{2x+4}$ **15.** _____

25. $f(x)=\sqrt{x^2+3}$ **16.** _____

26. The function $R(x)=132\sqrt{x}$ gives the total revenue per year in thousands of dollars generated by a small business having x employees. A graph of $y=R(x)$ is shown in the figure.



(a) Approximate values for $R(4)$, $R(8)$, and $R(12)$ by using both the formula and the graph. **26.(a)**_____

(b) Evaluate $R(12)-R(8)$ and $R(8)-R(4)$ using the formula. Interpret your answer. **(b)**_____

The Cube Root Function

Exercises 27-28: Refer to Example 13 on page 500 in your text and the Section 7.1 lecture video.

Evaluate $f(1)$ **and** $f(-3)$ ***for each*** $f(x)$**.**

27. $f(x) = \sqrt[3]{2x^2 - 1}$ **27.** _____

_____

28. $f(x) = \sqrt[3]{9 - x^2}$ **28.** _____

_____