

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

Date: \_\_\_\_\_

## Lesson 10 Practice Problems

### Section 10.1: Roots, Radicals, and Rational Exponents

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1. Complete the table below. Each expression should be written in radical notation, written with rational exponents and evaluated using the calculator. The first one is done for you.

	Written in radical notation	Written using rational exponents	Evaluated using the calculator (Rounded to two decimal places)
a)	$\sqrt[3]{9}$	$9^{1/3}$	$9^{(1/3)} \approx 2.08$
b)	$\sqrt[5]{20}$		
c)	$\sqrt[3]{2^4}$		
d)	$-\sqrt[4]{7^2}$		
e)	$\sqrt[3]{(-8)}$		
f)		$3^{1/4}$	
g)		$11^{1/7}$	
h)		$-4^{1/2}$	
i)		$(-2)^{2/3}$	

2. Evaluate the following using your graphing calculator. If there is no *real* solution, write “N”. Round answers to three decimal places if necessary.

a)  $2\sqrt{9}$

b)  $\frac{\sqrt[5]{-32}}{5}$

c)  $\frac{4}{\sqrt[3]{-64}}$

d)  $-\sqrt{46}$

e)  $\sqrt[4]{(-4)^2}$

f)  $\sqrt[4]{-80}$

g)  $\sqrt[3]{8^2}$

h)  $-\sqrt[3]{8^3}$

**Section 10.2: Square Root Functions – Key Characteristics**

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3. Complete the table below.

	<i>Function</i>	<i>Domain</i>	<i>Horizontal Intercept</i>	<i>Vertical Intercept</i>
a)	$g(x) = \sqrt{x - 2}$			
b)	$f(x) = \sqrt{4x - 6}$			
c)	$f(x) = 2\sqrt{4x + 2}$			
d)	$s(t) = \sqrt{3 - t}$			
e)	$h(x) = \sqrt{12 - 6x}$			

4. Use your graphing calculator to complete the table and sketch the graph of each of the functions below. Use an appropriate viewing window.

a)  $g(x) = \sqrt{x-2}$

$x$	$g(x) = \sqrt{x-2}$
2	
3	
6	



b)  $f(x) = \sqrt{4x-6}$

$x$	$f(x) = \sqrt{4x-6}$
$\frac{3}{2}$	
$\frac{7}{4}$	
$\frac{5}{2}$	



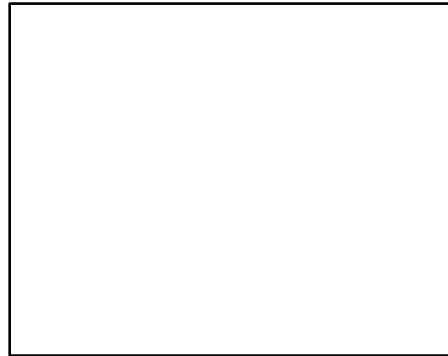
c)  $f(x) = 2\sqrt{4x+2}$

$x$	$f(x) = 2\sqrt{4x+2}$
$-\frac{1}{4}$	
$-\frac{1}{2}$	
0	



d)  $s(t) = \sqrt{3 - t}$

$t$	$s(t) = \sqrt{3 - t}$
0	
2	
3	



e)  $h(x) = \sqrt{12 - 6x}$

$x$	$h(x) = \sqrt{12 - 6x}$
0	
2	
$\frac{11}{6}$	



Section 10.3: Cube Root Functions – Key Characteristics

5. Complete the table below.

	<i>Function</i>	<i>Domain</i>	<i>Horizontal Intercept</i>	<i>Vertical Intercept</i>
a)	$f(x) = \sqrt[3]{x+8}$			
b)	$f(x) = \sqrt[3]{9-2x}$			

6. Use your graphing calculator to complete the tables and sketch the graphs of the functions below. Use an appropriate viewing window.

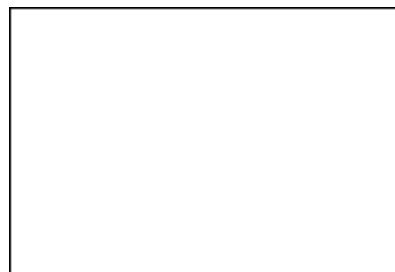
a)  $f(x) = \sqrt[3]{x+8}$

$x$	$f(x) = \sqrt[3]{x+8}$
-5	
0	
5	



b)  $f(x) = \sqrt[3]{9-2x}$

$x$	$f(x) = \sqrt[3]{9-2x}$
-5	
0	
5	



## Section 10.4: Radical Functions – Key Characteristics

7. For each of the functions below, determine the domain, horizontal intercept, vertical intercept. Then sketch the graph of the function on an appropriate viewing window.

a)  $f(x) = \sqrt[5]{8x - 32}$

Domain	Horizontal Intercept	Vertical Intercept	Graph

b)  $f(x) = \sqrt{9 - 2x}$

Domain	Horizontal Intercept	Vertical Intercept	Graph

c)  $f(x) = \sqrt[4]{5x - 20}$

Domain	Horizontal Intercept	Vertical Intercept	Graph

d)  $f(x) = \sqrt[3]{4x + 8}$

Domain	Horizontal Intercept	Vertical Intercept	Graph

e)  $f(x) = \sqrt[6]{-x}$

Domain	Horizontal Intercept	Vertical Intercept	Graph

f)  $f(x) = \sqrt[3]{1-x}$

Domain	Horizontal Intercept	Vertical Intercept	Graph

g)  $f(x) = \sqrt{4x+11}$

Domain	Horizontal Intercept	Vertical Intercept	Graph

h)  $f(x) = \sqrt[5]{-3x}$

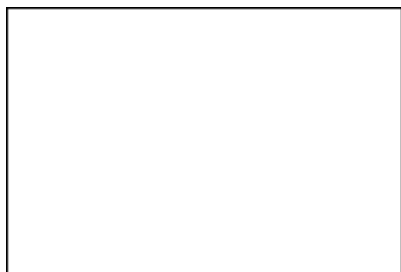
Domain	Horizontal Intercept	Vertical Intercept	Graph



## Section 10.5: Solve Radical Equations by Graphing

8. Solve each of the equations by graphing. Round any decimal results to three places. Sketch the graph on an appropriate viewing window. **Mark and label** the solution(s) on your graph.

a)  $6 + \sqrt[3]{7 - 3x} = 16$

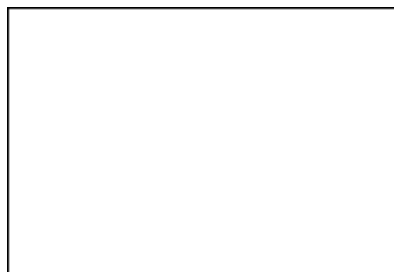


Xmin=\_\_\_\_\_ Xmax=\_\_\_\_\_

Ymin=\_\_\_\_\_ Ymax=\_\_\_\_\_

Solution(s): \_\_\_\_\_

b)  $\sqrt{3 - 2x} = 14$



Xmin=\_\_\_\_\_ Xmax=\_\_\_\_\_

Ymin=\_\_\_\_\_ Ymax=\_\_\_\_\_

Solution(s): \_\_\_\_\_

c)  $4\sqrt{x - 6} = 12$



Xmin=\_\_\_\_\_ Xmax=\_\_\_\_\_

Ymin=\_\_\_\_\_ Ymax=\_\_\_\_\_

Solution(s): \_\_\_\_\_

d)  $\sqrt[4]{2x + 8} + 5 = 0$



Xmin=\_\_\_\_\_ Xmax=\_\_\_\_\_

Ymin=\_\_\_\_\_ Ymax=\_\_\_\_\_

Solution(s): \_\_\_\_\_

e)  $\sqrt{5-x} - 7 = 2$

Xmin= \_\_\_\_\_ Xmax= \_\_\_\_\_

Ymin= \_\_\_\_\_ Ymax= \_\_\_\_\_

Solution(s): \_\_\_\_\_

f)  $5 - \sqrt[3]{5x} = 11$

Xmin= \_\_\_\_\_ Xmax= \_\_\_\_\_

Ymin= \_\_\_\_\_ Ymax= \_\_\_\_\_

Solution(s): \_\_\_\_\_

g)  $\sqrt{5-x} = x + 17$

Xmin= \_\_\_\_\_ Xmax= \_\_\_\_\_

Ymin= \_\_\_\_\_ Ymax= \_\_\_\_\_

Solution(s): \_\_\_\_\_

h)  $7 + \sqrt[3]{15x} = x - 8$

Xmin= \_\_\_\_\_ Xmax= \_\_\_\_\_

Ymin= \_\_\_\_\_ Ymax= \_\_\_\_\_

Solution(s): \_\_\_\_\_

**Section 10.6: Solve Radical Equations Algebraically**

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9. Solve each of the equations algebraically. Show all of your work. Round any decimal results to three places. Verify that your answer checks with the graphical solutions from problem 8.

a)  $6 + \sqrt[3]{7 - 3x} = 16$

b)  $\sqrt{3 - 2x} = 14$

c)  $4\sqrt{x - 6} = 12$

d)  $\sqrt[4]{2x + 8} + 5 = 0$

e)  $\sqrt{5 - x} - 7 = 2$

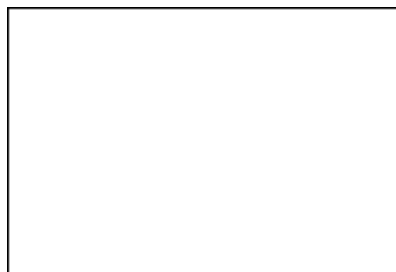
f)  $5 - \sqrt[3]{5x} = 11$

10. Solve each of the equations algebraically. Show all of your work. Round any decimal results to three places. Check by graphing. Sketch the graph on an appropriate viewing window. **Mark and label** the solution(s) on your graph.

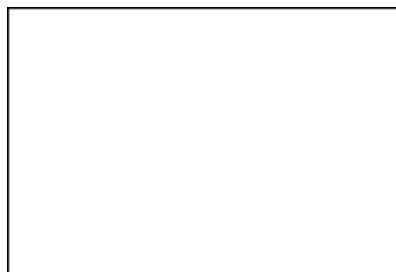
a)  $\sqrt{8x - 7} = x$



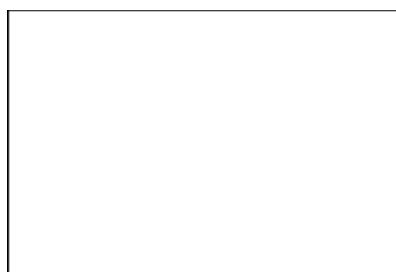
b)  $\sqrt{45 + 4x} = x$



c)  $\sqrt{4x} = x - 3$



d)  $\sqrt{2x + 10} + 5 = x + 6$



11. A person's Body Mass Index is calculated with the formula:  $BMI = \left(\frac{Weight}{Height^2}\right)703$  where

a) Weight is in pounds and Height is in inches. Rewrite the equation, solving for Height.

Height =

b) Each of the people listed below have a BMI of 30. Use the formula found in part a) to complete the table. Round to the nearest tenth as needed.

Name	Weight	Height
Sara	120	
Leonard		78
Marta	155	
Dillon		65
Mike	250	
Peggy		58

12. Voltage through a circuit is determined by the formula  $V = \sqrt{PR}$ , where  $P$  is power, measured in watts, and  $R$  is the resistance, measured in ohms. Round answers to two decimal places as needed.
- a) Determine the amount of resistance that is required for 2 watts of power to produce 4 volts.
- b) Determine the voltage produced if 100 watts is supplied with a resistance of 40 ohms.
- c) Determine the amount of power that must be supplied in order to produce 50 volts if the resistance is 30 ohms.