

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

**Solving Radical Equations Class Work**

Objective: You will be able to solve radical equations.



For Tasks A through C, answer each question with your group.



- ✓ How would you approach solving the problem?
- ✓ How could you express the problem using rational exponents?
- ✓ What relationships do you notice that may lead to a solution strategy?

**Task A**

*\* get radical one \* square both sides*

$$\sqrt{2x-4} + 12 = 0$$

$$(\sqrt{2x-4}) = -12$$

$$2x-4 = 144$$

$$2x = 148$$

$$x = 74$$

*raise to reciprocal power*

$$\sqrt{2x-4} = -12$$

$$(\sqrt{2x-4})^2 = (-12)^2$$

$$2x-4 = 144$$

$$x = 74$$

**Task B**

$$\sqrt[3]{3x+5} - 4 = 0$$

$$(\sqrt[3]{3x+5}) = 4$$

$$3x+5 = 64$$

$$3x = 59$$

$$x = 59/3$$

**Task C**

$$\sqrt{(x-1)^{3/4}} = 27$$

$$(x-1)^{3/4} = 27$$

$$x-1 = (\sqrt[4]{27})^4$$

$$x-1 = 3^4$$

$$x-1 = 81$$

$$x = 82$$

**Task D**

*raise to reciprocal power*

$$4 - 2(3x)^{2/3} = 12$$

$$2(3x)^{2/3} = -8$$

$$(3x)^{2/3} = -4$$

$$3x = (\sqrt[3]{-4})^3$$

$$3x = -8$$

$$x = -8/3$$

*check:*

$$4 + 2\left(\frac{-8}{3}\right)^{2/3}$$

$$4 + 2(-8)^{2/3}$$

$$= 12 \quad x = -8/3$$

A solution that does not work when plugged back in is called extraneous.

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Unit 7 Notes & Resources

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- ✔ How could you express the problem using rational exponents?
- ✔ What relationships do you notice that may lead to a solution strategy?



Task A

$$\sqrt{2x - 4} - 12 = 0$$

Task B

$$\sqrt[3]{3x + 5} - 4 = 0$$

Task C

$$\sqrt[4]{(x - 1)^3} = 27$$

Task D

$$4 - 2(3x)^{\frac{2}{3}} = 12$$

## solving radical equations

**Practice!** Solve each equation. Be sure to check for extraneous solutions.  
Please complete all work on a blank sheet of paper.

1.  $\frac{\sqrt[3]{(3x-8)^2}}{-7} = -7$

2.  $\sqrt[4]{5x-2} = 4$

3.  $\sqrt[5]{(2x+5)^2} = 144$

4.  $\frac{\sqrt{(x-3)^5}}{3} = 81$

5.  $\frac{\sqrt{(2x-3)^5}}{2} = 16$

6.  $\frac{\sqrt[7]{(5x-1)^3}}{-8} = -\frac{1}{8}$

7.  $\frac{\sqrt[3]{(2x+5)^5}}{4} = 256$

8.  $4\sqrt{2x} - 1 = 23$

9.  $2 * \sqrt[3]{(4x-3)^4} = 1250$

10.  $4 - 2(3x)^{\frac{1}{3}} = 12$

11.  $-2(3x)^{\frac{6}{5}} - 8 = -136$

12.  $2(x+1)^{\frac{2}{3}} = 162$

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**Challenge Yourself!** Assuming no extraneous solutions will arise, solve for  $a$ .

$$(a+b)^{\frac{3}{4}} - (c-d)^{\frac{1}{2}} = 0$$

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**Homework: p. 388-390**

#1-31 odd, 35-49 odd, 52, 60, 62, & 63

**These problems are challenges, but you still must try them! ☺**

#51 and 61

$$\textcircled{1} \frac{\sqrt[3]{(3x-8)^2}}{-7} = -7$$

$$\bullet -7 \qquad \bullet -7$$

$$\sqrt[3]{(3x-8)^2} = 49$$

$$\left( (3x-8)^{2/3} \right)^{3/2} = (49)^{3/2}$$

IF this is even, 2 possible solutions

$$3x-8 = (\sqrt{49})^3$$

$$3x-8 = 343$$

$$3x = 351$$

$$x = 117$$

$$3x-8 = -343$$

$$3x = -335$$

$$x = \frac{-335}{3}$$

***All problems on the back of the solving radical equations worksheet and page 388 #1, 5, 7, 9, 13, 15, 17, 25, 29, 37, 41, 60, 62, 63, 85, and 88 (due Friday)***

**Throwback Problems: #85, 88, and 89**

## solving radical equations

