*Whenever we take the SQUARE ROOT of both sides of an equation, we need ± symbol.

"plus or minus"

Pre-Algebra B Name/Date Solutions

ALL PROBLEMS CAN BE COMPLETED ON THIS WORKSHEET

WS 21.1 – Solving Nonlinear Equations

Solve each equation. If necessary, round to the nearest hundredth.

1. $x^2 = 64$

$\sqrt{x^2} = \sqrt{64}$

$x = \pm 8$

2. $x^2 = -64$

$\sqrt{x^2} = \sqrt{-64}$

no solution

cannot take square root of a negative

3. $x^3 = 64$

$\sqrt[3]{x^3} = \sqrt[3]{64}$

$x = 4$

4. $x^3 = -64$

$\sqrt[3]{x^3} = \sqrt[3]{-64}$

$x = -4$

5. $x^2 = 81$

$\sqrt{x^2} = \sqrt{81}$

$x = \pm 9$

6. $x^2 = 15$

$\sqrt{x^2} = \sqrt{15}$

$x \approx \pm 3.87$

7. $x^2 = \frac{1}{49}$

$\sqrt{x^2} = \sqrt{\frac{1}{49}}$

$x = \pm \frac{1}{7}$

8. $x^3 = 125$

$\sqrt[3]{x^3} = \sqrt[3]{125}$

$x = 5$

9. Which expression has a value that is between 6 and 7?

A. $\sqrt{24}$ ≈ 4.9 B. $\sqrt{33}$ ≈ 5.7 **C. $\sqrt{40}$ ≈ 6.3** D. $\sqrt{50}$ ≈ 7.1

10. Which expression has a value that is between 10 and 11?

A. $\sqrt{10.5}$ ≈ 3.2 B. $\sqrt{80}$ ≈ 8.9 C. $\sqrt{99}$ ≈ 9.9 **D. $\sqrt{115}$ ≈ 10.7**

11. Which expression has a value that is between 9 and 10?

A. $\sqrt{80}$ ≈ 8.9 B. $\sqrt{101}$ ≈ 10.0 C. $\sqrt[3]{725}$ ≈ 8.9 **D. $\sqrt[3]{999}$ ≈ 9.9**

12. What is the value of $\sqrt[3]{-220}$, to the nearest integer?

A. 5 B. −6.04 C. 6.04 **D. −6**

not integers

integer = positive and negative whole numbers

13. Put the following numbers in order from least to greatest.

$\sqrt[3]{150}$ ≈ 5.31 $\sqrt{39}$ ≈ 6.24 $\sqrt{50}$ ≈ 7.07 $7.\overline{1}$ = 7.1̄ $\sqrt[3]{435}$ ≈ 7.58

$\sqrt[3]{150}, \sqrt{39}, \sqrt{50}, 7.\overline{1}, \sqrt[3]{435}$ ← They were already in order!

14. Which of the following equations does not have a negative solution?

A. $x^2 = 32$

$\sqrt{x^2} = \sqrt{32}$

$x \approx \pm 5.7$

B. $x^3 = 164$

$\sqrt[3]{x^3} = \sqrt[3]{164}$

$x \approx 5.5$

C. $x^2 = 117$

$\sqrt{x^2} = \sqrt{117}$

$x \approx \pm 10.8$

D. $x^3 = -98$

$\sqrt[3]{x^3} = \sqrt[3]{-98}$

$x \approx -4.6$