Day 68

7.1 Roots and Radical Expressions

$5^2 = 25 \rightarrow \sqrt{25} = 5$

$5^3 = 125 \rightarrow \sqrt[3]{125} = 5$

$5^4 = 625 \rightarrow \sqrt[4]{625} = 5$

4 math 5: $\quad 4\sqrt{}$

$\sqrt{-25}$ undefined

$\sqrt[3]{-125} = -5$

25 -5

-5 -5

you can take the odd root OF negative #'s.

$\sqrt[5]{-32} = -2$

you can't take the even root of a negative #

$\sqrt[4]{-16}$ undefined

when you take the even root of a positive # there are 2 solutions ($\pm$)

For any negative #

even → $\sqrt[n]{a^n} = |a|$ ← odd when n is even

↑ the root

* abs. value bars are for the variables

Name _____ Block _____ Date _____

Practice 7-1 — Roots and Radical Expressions

Find each real-number root.

1. $\sqrt{144}$ 12
2. $-\sqrt{25}$ -5
3. $\sqrt{-0.01}$ undefined
4. $\sqrt[3]{0.001}$ .1
5. $\sqrt[4]{0.0081}$ .3
6. $\sqrt[3]{27}$ 3
7. $\sqrt[3]{-27}$ -3
8. $\sqrt{0.09}$ .3

Find all the real cube roots of each number.

9. 216 $\sqrt[3]{216} = 6$
10. -343 $\sqrt[3]{-343} = -7$
11. -0.064 $-.4$
12. $\frac{\sqrt[3]{1000}}{\sqrt[3]{27}} = \frac{10}{3}$

Find all the real square roots of each number.

13. 400 $\sqrt{400} = \pm 20$
14. $\sqrt{-196}$ undefined
15. 10,000 ± 100
16. 0.0625 $\pm .25$

even roots ($\pm$)

Find all the real fourth roots of each number.

17. $\sqrt[4]{-81}$ undefined
18. $\sqrt[4]{256}$ ± 4
19. $\sqrt[4]{0.0001}$ $\pm .1$
20. $\sqrt[4]{625}$ ± 5

Simplify each radical expression. Use absolute value symbols when needed.

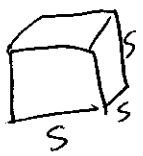
21. $\sqrt{81x^4}$ $= 9x^2$
22. $\sqrt{121y^{10}}$ $= 11|y^5|$
23. $\sqrt[3]{8g^6}$ $2g^2$
24. $\sqrt[3]{125x^9}$ $5x^3$

25. $\sqrt[5]{243x^5y^{15}}$ 26. $\sqrt[3]{(x-9)^3}$ 27. $\sqrt{25(x+2)^4}$ 28. $\sqrt[3]{\frac{64x^9}{343}}$

Find the two real-number solutions of each equation.

29. $\sqrt{x^2} = \sqrt{4}$ 30. $\sqrt[4]{x^4} = \sqrt[4]{81}$ 31. $\sqrt{x^2} = \sqrt{0.16}$ 32. $\sqrt{x^2} = \sqrt{\frac{16}{49}}$

33. A cube has volume $V = s^3$, where s is the length of a side. Find the side length for a cube with volume 8000 cm^3.



34. The velocity of a falling object can be found using the formula $v^2 = 64h$, where v is the velocity (in feet per second) and h is the distance the object has already fallen.

a. What is the velocity of the object after a 10-foot fall?

b. How much does the velocity increase if the object falls 20 feet rather than 10 feet?