

Honors Algebra II/Trig
7.1 Day 5 Worksheet

Name Key

Evaluate.

$$1. \quad 32^{\frac{2}{5}} \\ (2^5)^{\frac{2}{5}} = 2^2 = \boxed{4}$$

$$2. \quad -16^{\frac{1}{4}} \\ -(2^4)^{\frac{1}{4}} = \boxed{-2}$$

$$3. \quad 216^{\frac{-2}{3}} \\ (6^3)^{-\frac{2}{3}} = 6^{-2} = \boxed{\frac{1}{36}}$$

$$4. \quad (-625)^{\frac{3}{4}}$$

no solution
* can't take even root of neg #

$$5. \quad 64^{\frac{-1}{6}} \\ (2^6)^{-\frac{1}{6}} = 2^{-1} \\ = \boxed{\frac{1}{2}}$$

$$6. \quad (-125)^{\frac{4}{3}} \\ ((-5)^3)^{\frac{4}{3}} = (-5)^4 \\ = \boxed{625}$$

$$7. \quad 1000^{\frac{-2}{3}} \\ (10^3)^{\frac{-2}{3}} = 10^{-2} \\ = \boxed{\frac{1}{100}}$$

$$8. \quad -81^{\frac{-3}{4}} \\ -(3^4)^{\frac{-3}{4}} = -(3)^{-3} \\ = \frac{-1}{3^3} = \boxed{\frac{-1}{27}}$$

$$9. \quad (-32)^{\frac{3}{5}} \\ ((-2)^5)^{\frac{3}{5}} = (-2)^3 = \boxed{-8}$$

$$10. \quad 16^{\frac{3}{2}} \\ (4^2)^{\frac{3}{2}} = 4^3 = \boxed{64}$$

$$11. \quad -625^{\frac{-1}{4}} \\ -(5^4)^{-\frac{1}{4}} = -5^{-1} \\ = \boxed{\frac{-1}{5}}$$

$$12. \quad 32^{\frac{7}{5}} \\ (2^5)^{\frac{7}{5}} = 2^7 = \boxed{128}$$

$$13. \quad 729^{\frac{5}{6}} \\ (3^6)^{\frac{5}{6}} = 3^5 = \boxed{243}$$

$$14. \quad -125^{\frac{-2}{3}} \\ -(5^3)^{\frac{-2}{3}} = -(5)^{-2} \\ = \boxed{\frac{-1}{25}}$$

$$15. \quad -100^{\frac{5}{2}} \\ -(10^2)^{\frac{5}{2}} = -10^5 \\ = \boxed{-100000}$$

$$16. \quad 49^{\frac{3}{2}} \\ (7^2)^{\frac{3}{2}} = 7^3 = \boxed{343}$$

$$17. \quad 256^{\frac{5}{8}} \\ (2^8)^{\frac{5}{8}} = 2^5 = \boxed{32}$$

$$18. \quad (-27)^{\frac{4}{3}} \\ ((-3)^3)^{\frac{4}{3}} = (-3)^4 \\ = \boxed{81}$$

$$19. \quad \left(\frac{625}{81}\right)^{\frac{3}{4}} = \left(\frac{5^4}{3^4}\right)^{\frac{3}{4}} = \frac{5^3}{3^3}$$

$$20. \quad \left(\frac{-27}{125}\right)^{\frac{-4}{3}} = \left(\frac{(-3)^3}{(5)^3}\right)^{-\frac{4}{3}}$$

$$\frac{(-3)^{-4}}{5^{-4}} = \frac{5^4}{(-3)^4} = \boxed{\frac{625}{81}}$$

$$\boxed{\frac{125}{27}}$$

Simplify. Write all answers with positive exponents.

21. $\sqrt{15} \div \sqrt{3}$

$$\sqrt{\frac{15}{3}} = \boxed{\sqrt{5}}$$

22. $\sqrt{27} \div \sqrt[3]{9}$

$$\frac{\sqrt{27}}{\sqrt[3]{9}} = \frac{3^{3/2}}{3^{2/3}} = \boxed{3^{5/6}}$$

23. $\sqrt[3]{81} \cdot \sqrt{27}$

$$3^{4/3} \cdot 3^{3/2} = \boxed{3^{17/6}}$$

24. $\sqrt[3]{5^{2.7} \div 5^{1.2}}$

$$\sqrt[3]{5^{1.5}} = 5^{1.5/3} = \boxed{5^{1/2}}$$

25. $\sqrt[6]{10^{8.2} \cdot 10^{1.3} \div 10^{2.9}}$

$$\sqrt[6]{10^{9.5} \div 10^{2.9}}$$

$$\sqrt[6]{10^{6.6}} = \boxed{10^{1.1}}$$

26. $\sqrt[5]{\sqrt{125}}$

$$(5^3)^{1/5})^{1/3} = \boxed{5^{1/5}}$$

27. $\sqrt[3]{\sqrt{27}}$

$$(3^3)^{1/2})^{1/3} = \boxed{3^{1/2}}$$

28. $\sqrt[3]{16} \div \sqrt[3]{2}$

$$2^{4/3} \div 2^{1/3} = \boxed{2}$$

$$\sqrt[3]{\frac{16}{2}} = \sqrt[3]{8} = \boxed{2}$$

29. $\sqrt[3]{32} \div \sqrt[3]{16}$

$$2^{5/3} \div 2^{4/3} = \boxed{2^{1/3}}$$

30. $\sqrt[6]{8} \cdot \sqrt[4]{4}$

$$2^{1/2} \cdot 2^{1/2} = \boxed{2}$$

31. $\sqrt[4]{6^{2.8} \cdot 6^{5.2}}$

$$\sqrt[4]{6^8} = 6^2 = \boxed{36}$$

32. $\sqrt[3]{10^{8.1} \div 10^{2.1} \cdot 10^{1.5}}$

$$\sqrt[3]{10^6 \cdot 10^{1.5}}$$

$$\sqrt[3]{10^{7.5}} = \boxed{10^{2.5}}$$

33. $\sqrt[4]{\sqrt{64}}$

$$(2^6)^{1/2})^{1/4} = \boxed{2^{3/4}}$$

34. $\sqrt[5]{\sqrt[4]{\sqrt[3]{16}}}$

$$(2^4)^{1/3})^{1/4})^{1/5} = \boxed{2^{1/15}}$$

Solve.

35. $25^x = \frac{1}{5}$

$$5^{2x} = 5^{-1}$$

$$2x = -1$$

$$\boxed{x = -1/2}$$

36. $8^x = 32$

$$2^{3x} = 2^5$$

$$3x = 5$$

$$\boxed{x = 5/3}$$

37. $3^x = \frac{1}{81}$

$$3^x = 3^{-4}$$

$$\boxed{x = -4}$$