Name: Date:

مدرسة الاتحاد الوطنية الخاصة - العين
Al Ittihad National Private School - Al Ain

Grade 9 Worksheet

Lessons:
6.1 Define and Apply Dilations

1) Solve for n in each expression.

9. $\sqrt[6]{a} = a^n$ **10.** $\sqrt[9]{a} = a^n$ **11.** $\sqrt[3]{a^7} = a^n$

12. $\sqrt[3]{a^2} = a^n$ **13.** $\sqrt[7]{a^6} = a^n$ **14.** $\sqrt[4]{a^5} = a^n$

15. $\sqrt[5]{a^6} = a^n$ **16.** $\sqrt[4]{a^9} = a^n$ **17.** $\sqrt{a^3} = a^n$

Q2) Show two ways to evaluate each expression.

33. $4^{\frac{3}{2}}$ **34.** $9^{\frac{5}{2}}$ **35.** $8^{\frac{5}{3}}$

36. $27^{\frac{4}{3}}$ **37.** $64^{\frac{3}{2}}$ **38.** $16^{\frac{7}{4}}$

Q3) Describe the expression as a combination of a root and whole-number power.

44. $x^{\frac{2}{3}}$ **45.** $x^{\frac{1}{6}}$ **46.** $(7y)^{\frac{6}{5}}$ **47.** $(7y)^{\frac{7}{2}}$

Q4) Write each expression as a radical expression

52. $5^{\frac{3}{2}}$ **53.** $3^{\frac{7}{4}}$ **54.** $(-64)^{\frac{2}{3}}$

55. $81^{\frac{3}{4}}$ **56.** $t^{\frac{7}{6}}$ **57.** $(xy)^{\frac{9}{5}}$

58. $(16x)^{\frac{3}{4}}$ **59.** $(-25a)^{\frac{4}{9}}$ **60.** $\left(\frac{xy}{27}\right)^{\frac{5}{3}}$

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Q5) Write each radical expression as an expression with a rational exponent.

66. $\left(\sqrt[3]{8}\right)^5$ **67.** $\sqrt[4]{49^3}$ **68.** $\left(\sqrt[4]{256}\right)^2$

69. $\sqrt[5]{9^2}$ **70.** $\sqrt[7]{r^8}$ **71.** $\left(\sqrt[4]{\frac{a}{b}}\right)^6$

72. $\left(\sqrt[9]{-27x}\right)^3$ **73.** $\left(\sqrt{\frac{xy}{4}}\right)^3$ **74.** $\left(\sqrt[6]{uv}\right)^7$

Q6) (MP) **Use Structure** Are the expressions $6^{\frac{6}{3}}$ and $6^{\frac{8}{4}}$ equivalent? Explain. If the bases were -6 instead of 6, would your reasoning still hold true?