

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

Due the day of the test!

**Instructions:** Do all work on your own paper. For problems that require multiple steps, show your work in a clear manner. Transfer your answers to this sheet.

Evaluate each radical. If the radical does not represent a real number, so state.

1.  $\sqrt{100}$  \_\_\_\_\_

2.  $\sqrt{49a^2}$  \_\_\_\_\_

3.  $\sqrt{-36m^2}$  \_\_\_\_\_

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

5.  $\sqrt[3]{-216}$  \_\_\_\_\_

6.  $-\sqrt[3]{-8}$  \_\_\_\_\_

7.  $\sqrt[4]{16r^8s^4}$  \_\_\_\_\_

8.  $\sqrt[3]{-125u^9v^6}$  \_\_\_\_\_

Find the real roots of each equation. If there are none, so state.

10.  $2y^2 = 128$  \_\_\_\_\_

11.  $x^2 + 16 = 0$  \_\_\_\_\_

12.  $\frac{x^5}{8} - 4 = 0$  \_\_\_\_\_

13.  $8y^3 + 125 = 0$  \_\_\_\_\_

14.  $\frac{16x^2 + 7x}{7} = \frac{4x + 7}{4}$  \_\_\_\_\_

15.  $\frac{a^2(64a^2 - 3)}{3} = \frac{27 - 4a^2}{4}$  \_\_\_\_\_

Simplify. Assume that the given radicals denote real numbers.

18.  $\sqrt{175}$  \_\_\_\_\_

19.  $\frac{12}{\sqrt{6}}$  \_\_\_\_\_

20.  $\sqrt{30} \cdot \sqrt{\frac{5}{6}}$  \_\_\_\_\_

21.  $\sqrt[3]{135}$  \_\_\_\_\_

22.  $\sqrt[3]{-250r^6}$  \_\_\_\_\_

23.  $\sqrt{360rs^2t^3}$  \_\_\_\_\_

24.  $\sqrt{\frac{9u^4}{5}}$  \_\_\_\_\_

25.  $\sqrt[3]{\frac{16m^4}{3}}$  \_\_\_\_\_

26.  $\sqrt{\frac{50s^3}{108t^3}}$  \_\_\_\_\_

27.  $\sqrt{5b^3cd} \cdot \sqrt{20bc^5}$  \_\_\_\_\_

28.  $\sqrt[3]{10u^2v} \cdot \sqrt[3]{(5uv)^2}$  \_\_\_\_\_

29.  $\sqrt{3ab^2} \cdot \sqrt[4]{49a^4b^2}$  \_\_\_\_\_

30.  $\sqrt{10cd} \cdot \sqrt{6de^2} \cdot \sqrt{3c^2e^2}$  \_\_\_\_\_

31.  $\frac{\sqrt{48x^5y}}{\sqrt{3xy}}$  \_\_\_\_\_

32.  $\frac{\sqrt{20e^7f}}{\sqrt{45ef^3}}$  \_\_\_\_\_

33.  $\frac{\sqrt[3]{54h^4j^2}}{\sqrt[3]{10hj}}$  \_\_\_\_\_

34.  $\frac{\sqrt[3]{-24rs}}{\sqrt[3]{25r^4s^8}}$  \_\_\_\_\_

NAME Answers DATE \_\_\_\_\_ SCORE \_\_\_\_\_

### Roots of Real Numbers; Properties of Radicals

Evaluate each radical. If the radical does not represent a real number, so state.

1.  $\sqrt{100}$  10      2.  $\sqrt{49a^2}$   $7|a|$       3.  $\sqrt{-36m^2}$  not real  
 4.  $\sqrt[3]{27}$  3      5.  $\sqrt[3]{-216}$  -6      6.  $-\sqrt{-8}$  2  
 7.  $\sqrt[4]{16r^8s^4}$   $2r^2|s|$       8.  $\sqrt[3]{-125u^9v^6}$   $-5u^3v^2$

Find the real roots of each equation. If there are none, so state.

10.  $2y^2 = 128$  8, -8      11.  $x^2 + 16 = 0$  no real roots  
 12.  $\frac{x^3}{8} - 4 = 0$  2      13.  $8y^3 + 125 = 0$   $-\frac{5}{2}$   
 14.  $\frac{16x^2 + 7x}{7} = \frac{4x + 7}{4}$   $-\frac{7}{8}, \frac{7}{8}$       15.  $\frac{a^2(64a^2 - 3)}{3} = \frac{27 - 4a^2}{4}$   $-\frac{3}{4}, \frac{3}{4}$

For what values of the variable are the following statements true?

Simplify. Assume that the given radicals denote real numbers.

18.  $\sqrt{175}$   $5\sqrt{7}$       19.  $\frac{12}{\sqrt{6}}$   $2\sqrt{6}$       20.  $\sqrt{30} \cdot \sqrt{\frac{5}{6}}$  5  
 21.  $\sqrt[3]{135}$   $3\sqrt[3]{5}$       22.  $\sqrt[3]{-250r^6}$   $-5r^2\sqrt[3]{2}$       23.  $\sqrt{360rs^2t^3}$   $6|st|\sqrt{10rt}$   
 24.  $\sqrt{\frac{9u^4}{5}}$   $\frac{3u^2\sqrt{5}}{5}$       25.  $\sqrt[3]{\frac{16m^4}{3}}$   $\frac{2m\sqrt[3]{18m}}{3}$       26.  $\sqrt{\frac{50s^3}{108r^3}}$   $\frac{5s\sqrt{6st}}{18r^2}$   
 27.  $\sqrt{5b^3cd} \cdot \sqrt{20bc^3}$   $10b^2|c^3|\sqrt{d}$       28.  $\sqrt[3]{10u^2v} \cdot \sqrt[3]{(5uv)^2}$   $5uv\sqrt[3]{2u}$   
 29.  $\sqrt{3ab^2} \cdot \sqrt[3]{49a^4b^3}$   $a|b|\sqrt{21|a|b|}$       30.  $\sqrt{10cd} \cdot \sqrt{6de^2} \cdot \sqrt{3c^2e^2}$   $6cde^2\sqrt{5c}$   
 31.  $\frac{\sqrt{48x^4y}}{\sqrt{3xy}}$   $\frac{4x^2}{3}$       32.  $\frac{\sqrt{20e^7f}}{\sqrt{45ef^3}}$   $\frac{2|e^3|}{3|f|}$   
 33.  $\frac{\sqrt[3]{54h^3j^2}}{\sqrt{10hj}}$   $\frac{3h\sqrt[3]{25j}}{5}$       34.  $\frac{\sqrt[3]{-24rs}}{\sqrt{25r^4s^8}}$   $\frac{-2\sqrt[3]{15s^2}}{5rs^3}$

*\* I will not mark off points for the absolute value rule (Even, Even, odd)*