Honors, Algebra 2 Name Key ID: 1

Review Radical Relationships Test Review

Date _____ Period ____

Simplify.

1) $(81p^4)^{\frac{1}{2}}$

$9p^2$

2) $(625k^{12})^{\frac{3}{4}}$

$125k^9$

3) $(p^6)^{\frac{1}{2}}$

p^3

4) $(49x^2)^{-\frac{3}{2}}$ $\frac{1}{343x^3}$

5) $(m^6)^{-\frac{1}{2}}$ $\frac{1}{m^3}$

Write each expression in radical form.

6) $(2n)^{\frac{4}{3}}$

$(\sqrt[3]{2n})^4$

7) $r^{\frac{5}{6}}$

$(\sqrt[6]{r})^5$

8) $n^{\frac{1}{2}}$

$\sqrt{n}$

9) $n^{\frac{1}{4}}$

$\sqrt[4]{n}$

10) $(7n)^{\frac{5}{3}}$

$(\sqrt[3]{7n})^5$

Simplify. Your answer should contain only positive exponents with no fractional exponents in the denominator.

11) $\frac{y^3 \cdot yx^{\frac{3}{4}}}{\left(x^{-\frac{1}{2}}y^{\frac{7}{4}}\right)^{\frac{5}{3}}}$ $y^{\frac{13}{12}}x^{\frac{19}{12}}$

12) $\frac{b^2 \cdot a^2b^2}{\left(a^{-2}b^{\frac{5}{3}}\right)^{\frac{1}{3}} \cdot a^{-\frac{7}{4}}b^{\frac{1}{2}}}$ $a^{\frac{53}{12}}b^{\frac{53}{18}}$

13) $\frac{\left(a^{\frac{1}{4}}b^0\right)^{\frac{4}{3}}}{a^{\frac{1}{2}}b^{\frac{3}{4}} \cdot a^{-\frac{5}{4}}b^{\frac{5}{3}}}$ $\frac{a^{\frac{13}{12}}b^{\frac{7}{12}}}{b^3}$

14) $\frac{u^{-1}v^{-2}}{u^{-1}v^0 \cdot (uv^0)^{\frac{3}{4}}}$ $\frac{u^{\frac{1}{4}}}{v^2u}$

15) $\dfrac{\left(\left(y^{\frac{3}{2}}\right)^{-1} \cdot xy^{0}\right)^{\frac{3}{2}}}{y}$ $\dfrac{x^{\frac{3}{2}}y^{\frac{3}{4}}}{y^{4}}$

16) $\dfrac{u^{\frac{1}{2}}v^{\frac{3}{2}}}{\left(u^{-\frac{3}{2}}v^{\frac{2}{3}}\right)^{\frac{3}{2}} \cdot \left(vu^{2}\right)^{\frac{1}{2}}}$ $u^{\frac{7}{4}}$

17) $\dfrac{\left(x^{2}x^{0}\right)^{-\frac{5}{4}}}{\left(x^{\frac{1}{4}}y^{2}\right)^{-\frac{1}{3}}}$ $\dfrac{x^{\frac{7}{12}}y^{\frac{2}{3}}}{x^{3}}$

18) $\left(\dfrac{x^{\frac{1}{4}}y^{2} \cdot \left(x^{-2}y^{\frac{3}{4}}\right)^{\frac{2}{3}}}{x^{0}y^{\frac{2}{3}}}\right)^{-\frac{1}{4}}$ $\dfrac{x^{\frac{13}{48}}y^{\frac{13}{24}}}{y}$

19) $\dfrac{uv}{u^{\frac{1}{4}} \cdot \left(v^{3}\right)^{-\frac{1}{4}}}$ $v^{\frac{7}{4}}u^{\frac{3}{4}}$

20) $\left(\dfrac{yx^{\frac{1}{2}}}{x^{\frac{1}{2}} \cdot x^{0}y^{\frac{7}{4}}}\right)^{-3}$ $y^{\frac{9}{4}}$

Solve each equation. Remember to check for extraneous solutions.

21) $3 = \sqrt{17 - k}$

{8}

22) $\sqrt{3v - 174} = \sqrt{\dfrac{v}{10}}$

{60}

23) $7 = \sqrt{9 - 5a}$

{−8}

24) $\sqrt{42 - v} = v$

{6}

25) $10 = \sqrt{11m + 12}$

{8}

26) $-2 - \sqrt{2v + 10} = \sqrt{-1 - v}$

No solution.

27) $3 - \sqrt{2n + 3} = \sqrt{2n - 6}$

{3}

28) $\sqrt{n} = n - 2$

{4}

29) $\sqrt{5a + 1} = 2 - \sqrt{9 - 7a}$

No solution.

30) $-4 = \sqrt{2 - m} - \sqrt{9m - 2}$

{2}

Name _____ Date _____ Class _____

Solving Radical Equations and Inequalities

Solve each equation.

1. $\sqrt{x+6}=7$

$x = 43$

2. $\sqrt{5x}=10$

$x = 20$

3. $\sqrt{2x+5}=\sqrt{3x-1}$

$x = 6$

4. $\sqrt{x+4}=3\sqrt{x}$

$x = 1/2$

5. $\sqrt[3]{x-6}=\sqrt[3]{3x+24}$

$x = -15$

6. $3\sqrt[3]{x}=\sqrt[3]{7x+5}$

$x = 1/4$

7. $\sqrt{-14x+2}=x-3$

no solution

8. $(x+4)^{\frac{1}{2}}=6$

$x = 32$

9. $4(x-3)^{\frac{1}{2}}=8$

$x = 7$

10. $4(x-12)^{\frac{1}{3}}=-16$

$x = -52$

Solve each inequality.

11. $\sqrt{3x+6}\le 3$

$[-2, 1]$

12. $\sqrt{x-4}+3>9$

$(40, \infty)$

13. $\sqrt{x+7}\ge\sqrt{2x-1}$

$[1/2, 8]$

14. $\sqrt{2x-7}>9$

$(44, \infty)$

Solve.

15. A biologist is studying two species of animals in a habitat. The population, p_1, of one of the species is growing according to $p_1 = 500t^{\frac{3}{2}}$ and the population, p_2, of the other species is growing according to $p_2 = 100t^2$ where time, t, is measured in years. After how many years will the populations of the two species be equal?

After 25 years, the population of the two species will be equal

$500t^{\frac{3}{2}} = 100t^2$

$\frac{500t^{3/2}}{100t^2} = \frac{100t^2}{100t^2}$

$5t^{-1/2} = 1$

$\rightarrow t^{-1/2} = \frac{1}{5}$

$\frac{1}{t^{1/2}} = \frac{1}{5}$

$\frac{1}{\sqrt{t}} = \frac{1}{5} \rightarrow \frac{1}{\sqrt{25}} = \frac{1}{5}$

$(t = 25)$