Algebra 2   Name_____

Chapter 5 Final Practice Problems

Exponential Form vs. Radical form: $x^{\frac{a}{b}} = \left(\sqrt[b]{x}\right)^a$ **Convert the following:**

1) $\sqrt{7}$ $\quad 7^{\frac{1}{2}}$

2) $\dfrac{1}{\left(\sqrt[5]{3p}\right)^7}$ $\quad (3p)^{-\frac{7}{5}}$

3) $3^{\frac{8}{5}}$ $\quad \left(\sqrt[5]{3}\right)^8$

4) $(4r)^{-\frac{4}{3}}$ $\quad \dfrac{1}{\left(\sqrt[3]{4r}\right)^4}$

Simplify. Leave in "original" form (either exponential or radical form). Rationalize any denominator (i.e. no fractional exponents or radicals in denominator). Remember: $\sqrt[a]{x^a} = |x|$ **when a is even!!**

5) $4ab^{\frac{5}{3}} \cdot 4a^{\frac{1}{2}}$ $\quad 16b^{\frac{5}{3}}a^{\frac{3}{2}}$

6) $\left(x^{\frac{1}{3}}y^{\frac{3}{2}}\right)^{\frac{1}{2}}$

$x^{\frac{1}{6}}y^{\frac{3}{4}}$

7) $\sqrt[4]{80xy^6z^5}$

$2|y| \cdot |z|\sqrt[4]{5xy^2z}$

8) $\sqrt[3]{375x^3y^5z^3}$

$5xyz\sqrt[3]{3y^2}$

9) $\dfrac{\sqrt[4]{x^3y^2}}{\sqrt[4]{xy^3}}$

$\dfrac{\sqrt{x} \cdot \sqrt[4]{y^3}}{y}$

10) $xz^{-\frac{1}{2}} \cdot \dfrac{1}{x^{\frac{9}{5}}z^{\frac{7}{4}}}$

$\dfrac{x^{\frac{1}{5}}z^{\frac{3}{4}}}{xz^3}$

Solve each equation.

11) $512 = n^{\frac{3}{2}}$

$\{64\}$

12) $b^{-\frac{1}{2}} = \dfrac{1}{9}$

$\{81\}$

13) $27 = (35 - 2m)^{\frac{3}{4}}$

$\{-23\}$

14) $10\sqrt[3]{2x - 2} - 6 = 14$

5

15) $4x^4 = 12$

$\pm \sqrt[4]{3}$

Solve each equation. Remember to check for extraneous solutions.

16) $\sqrt{29 - 4n} = n - 6$

$\{7\}$

17) $\sqrt{28 - 4x} = x - 8$

No solution.

Find the inverse of each function.

18) $f(x) = \dfrac{-2x + 10}{3}$

$f^{-1}(x) = \dfrac{10 - 3x}{2}$

19) $h(x) = 3 + (x + 1)^3$

$h^{-1}(x) = \sqrt[3]{x - 3} - 1$

20) $f(x) = (x - 1)^2 + 3 \; ; \; x \le 1$

$f^{-1}(x) = -\sqrt{x - 3} + 1$

Are these functions inverses? Use the composite function test and explain Yes or No.

21) $g(x) = (x - 1)^5 + 2$
$f(x) = \sqrt[5]{x - 2} + 1$

Yes

22) $g(x) = -2x^3 - 1$
$f(x) = 2 + x^3$

No

23) Is $f(x) = \sqrt[3]{x}$ even / odd / neither? Is

$f(x) = x^{\frac{2}{3}}$ even / odd / neither? Is $g(x) = x^{\frac{1}{4}}$
even / odd / neither?

odd / even / neither
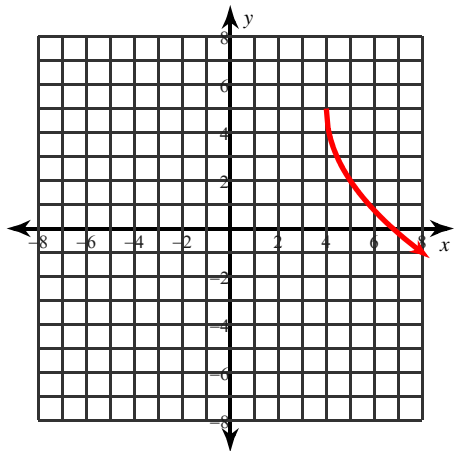
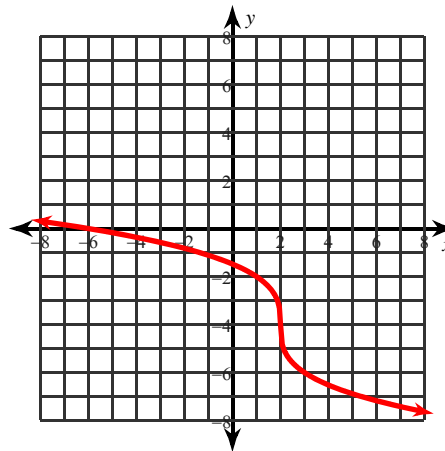24) Given $f(x) = 5x^{\frac{5}{4}}$ and $g(x) = 4x^{\frac{1}{4}}$
Find $f(x) + g(x)$ and state the domain

Find $\dfrac{f(x)}{g(x)}$ and state the domain

25) Graph $y = -3\sqrt{x-4} + 5$. State domain/range. State the transformations of the parent graph $\sqrt{x}$.

26) Graph $y = -2\sqrt[3]{x-2} - 4$. State the domain and the range. State the transformations of the parent graph $\sqrt[3]{x}$.

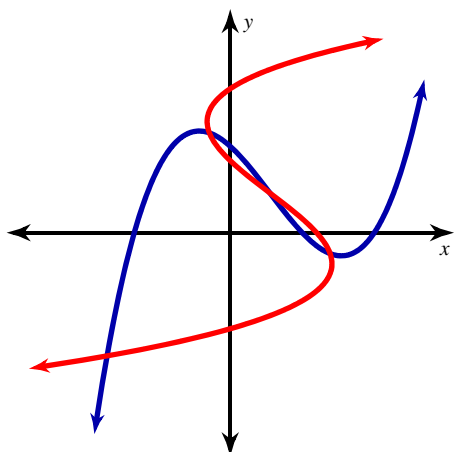**Solve each equation. Remember to check for extraneous solutions.**
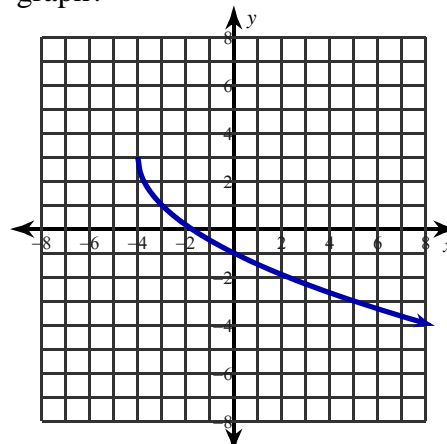
27) $3 + \sqrt{5-p} = \sqrt{2p-1}$

$\{5\}$

28) $16 > \sqrt{6-x}$

$-250 < x \le 6$

29) Sketch the inverse of the function. Will the inverse be a function? Explain.

30) What is the equation for the following graph?

$y = -2\sqrt{x+4} + 3$