

REVIEW FOR RADICALS TEST NAME: \_\_\_\_\_

**SECTION 1: Inverses**

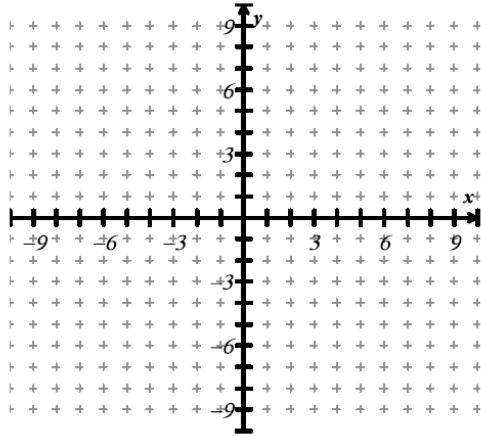
Find the inverse function

1. $y = 2x + 4$	2. $f(x) = -\frac{2}{3}x + 5$
3. $f(x) = \frac{1}{2}x^2 + 5$	4. $y = (x + 4)^3 - 2$

**Verify** the inverses.

5. $f(x) = x^2$ $g(x) = \sqrt{x}$	6. $f(x) = 2x - 8$ $g(x) = \frac{1}{2}x + 4$
7. $f(x) = (x - 5)^3$ $g(x) = \sqrt[3]{x} + 5$	8. $f(x) = 3x^2 + 4$ $g(x) = \sqrt{\frac{1}{3}x - \frac{4}{3}}$

9. Graph the inverse on the same graph.



10. Does the table represent a function?

11. Find the inverse. Is the inverse a function?

### SECTION 2: Domain of Radical Functions

Find the domain of each function.

1.  $f(x) = x^2 + 4$

2.  $f(x) = \sqrt{x}$

3.  $f(x) = \sqrt{x-1} + 4$

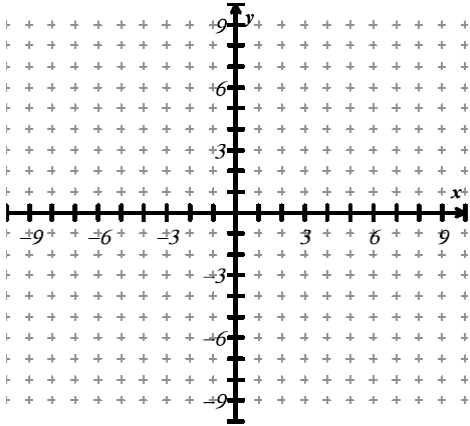
4.  $f(x) = \sqrt{2x-3}$

5.  $f(x) = (5x-3)^{\frac{1}{2}}$

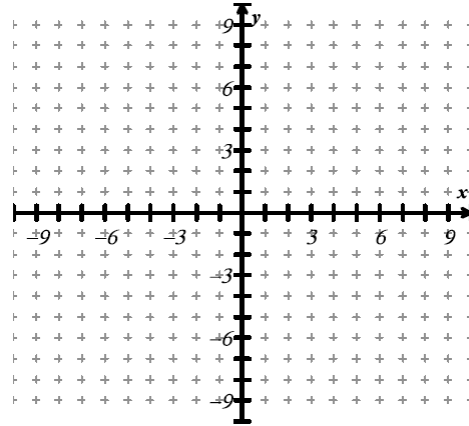
6.  $f(x) = x^{\frac{1}{3}}$

## SECTION 3: Graphing Radical Functions

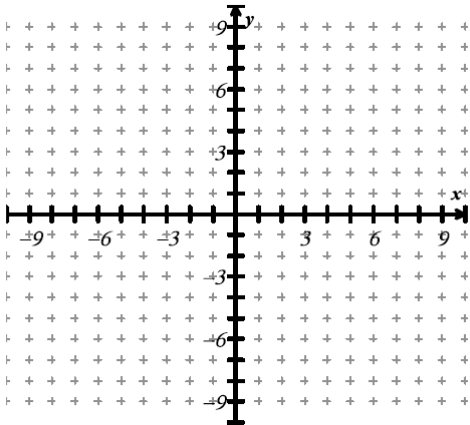
1.  $f(x) = \sqrt{x+3}$



2.  $f(x) = 2\sqrt{x} + 4$



3.  $f(x) = -3\sqrt{x+5} + 4$



4. Key Features of Graph #3.

Initial Point (h, k): \_\_\_\_\_

x-intercept: \_\_\_\_\_

y-intercept: \_\_\_\_\_

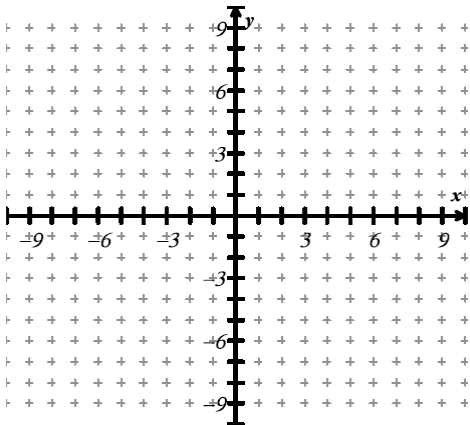
Domain: \_\_\_\_\_

Range: \_\_\_\_\_

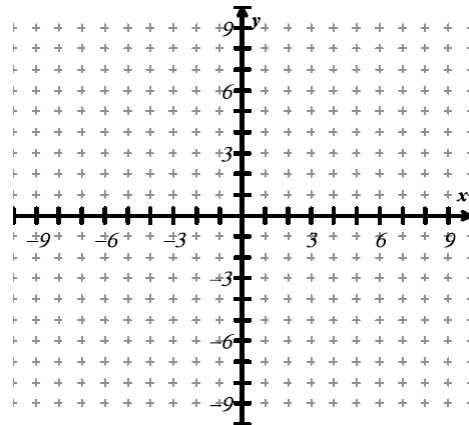
Increasing: \_\_\_\_\_

Decreasing: \_\_\_\_\_

5.  $f(x) = \sqrt[3]{x+1} + 2$



6.  $f(x) = -2\sqrt[3]{x} + 3$



## SECTION 4: Simplifying Radicals

Convert the radical form to exponential form and vice versa.

1. $x^{1/9} =$	2. $\sqrt{x^6} =$	3. $x^{2/3} =$
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Convert and evaluate.

7. $81^{1/4}$	8. $(-64)^{2/3}$	9. $196^{1/2}$
10. $125^{-2/3}$	11. $-32^{2/5}$	12. $\left(\frac{121}{4}\right)^{-1/2}$

Simplify the nth roots.

13. $\sqrt{-50}$	14. $\sqrt[3]{-128}$	15. $\sqrt[4]{64}$
16. $(\sqrt[5]{-64})^2$	17. $\sqrt[3]{108}$	18. $\sqrt[3]{135}$

Simplify the nth roots (with variables).

19. $\sqrt[3]{108x^7y^{10}}$	20. $\sqrt[4]{48x^7y^{13}}$	21. $\sqrt[3]{-8a^6b^7} \cdot \sqrt[3]{7a^2b^{14}}$
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## SECTION 5: Operations with Nth Roots

Multiply/Divide.

1. $\sqrt[4]{2} \cdot \sqrt[4]{5}$	2. $\sqrt[5]{\frac{-128}{4}}$
3. $2\sqrt[3]{6x^2} \cdot \sqrt[3]{4x^5}$	4. $\frac{\sqrt[3]{-256}}{\sqrt[3]{2}}$
5. $10\sqrt[5]{8} \cdot 3\sqrt[5]{-8}$	6. $\frac{\sqrt{84x^5y^3}}{\sqrt{7}}$

Add/Subtract.

7. $4\sqrt[3]{10} + 2\sqrt[3]{10}$	8. $2\sqrt{7} + 5\sqrt{7} + \sqrt{7}$
9. $\sqrt[3]{5} - 19\sqrt[3]{5}$	10. $\sqrt[3]{128} - \sqrt[3]{250}$
11. $5a\sqrt[4]{32a^5} - \sqrt[4]{2a^9}$	12. $5\sqrt[4]{20} - 5\sqrt[4]{45} + \sqrt[4]{125}$

## SECTION 6: Rationalize the Denominator

Rationalize the denominator.

1. $\frac{7}{\sqrt{2}}$	2. $\frac{-2}{5\sqrt{3}}$
3. $\frac{1}{\sqrt[4]{6}}$	4. $\frac{3}{5\sqrt[3]{2}}$
5. $\frac{10}{\sqrt[4]{5^2}}$	6. $\frac{2}{\sqrt[3]{4^2}}$
7. $\frac{1}{9-\sqrt{2}}$	

**Review – simplify the exponents!**

9. $\left(x^{2/3}\right)\left(x^{4/5}\right)$	10. $\frac{x^{1/4}}{x^{3/5}}$	11. $\left(x^{2/3}\right)^{6/7}$
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## SECTION 7: Solve Power Equations

5.  $5x^4 = 405$

6.  $\frac{-1}{8}x^3 = 2$

7.  $2x^2 + 12 = -150$

8.  $(x + 1)^5 = 30$

9.  $(x - 2)^3 + 13 = -112$

10.  $2(x - 2)^2 - 7 = -107$

11.  $\frac{1}{5}(x - 1)^4 + 5 = 130$

12.  $-\frac{3}{4}x^5 = 96$

## SECTION 8: Solve Radical Equations

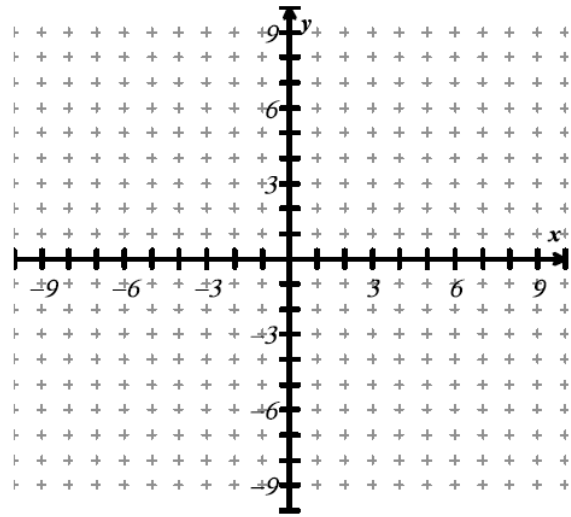
1. $\sqrt{6x+1}+10=17$	2. $2\sqrt[3]{x-5}+15=5$
3. $3\sqrt{x}=\sqrt{5x+27}$	4. $x^{\frac{1}{3}}=16$
5. $\sqrt{3x^2-2}-1=3$	6. $\sqrt{\frac{x}{3}}+11=13$
7. $\sqrt[4]{4x-17}=\sqrt[4]{3x+3}$	8. $-2(x-4)^{1/2}=-5$
9. $\sqrt{21x+1}=x+5$	10. $\sqrt{7x+15}=x+1$



<p><b>1. Simplify Nth Roots</b></p> <p>a) Convert:</p> <p>b) Evaluate:</p> <p>c) Simplify:</p> <p>d) Simplify with variables:</p>	<p><b>2. Operations with Nth Roots</b></p> <p>a) Multiply/Divide:</p> <p>b) Add/Subtract:</p> <p>c) Rational Exponent Properties</p>
<p><b>3. Rationalize Nth Roots:</b></p> <p>a) Monomial Denominator                      b) Binomial Denominator</p>	
<p><b>4. Solve Power Equations</b></p> <p>a) Isolate the power.</p> <p>b) nth root both sides.</p> <p>c) Even roots need <math>\pm</math>. Odd roots do not need <math>\pm</math>.</p>	<p><b>5. Solve Radical Equations</b></p> <p>a) Isolate the radical.</p> <p>b) Raise both sides to the nth power.</p>

6. Domain

7. Graphing Square Root Functions



8. Inverses

9. Graphing Cube Root Functions

