Name: _____ **Class:** _____ **Date:** _____ **ID: A**

Algebra 2 - Chapter 6 Test Review

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Find all the real fourth roots of $\frac{256}{2401}$.
   a. $\frac{4}{7}$ and $\frac{16}{49}$
   b. $-\frac{4}{7}$ and $\frac{4}{7}$
   c. $\frac{4}{7}, -\frac{4}{7}, \frac{16}{49}$, and $-\frac{16}{49}$
   d. $\frac{4}{7}$

Find the real-number root.

2. $\sqrt[3]{-\frac{125}{343}}$
   a. $\frac{25}{49}$
   b. $-\frac{125}{343}$
   c. $-\frac{125}{1029}$
   d. $-\frac{5}{7}$

What is a simpler form of the radical expression?

3. $\sqrt{36g^6}$
   a. $36|g^3|$
   b. $36g^4$
   c. $6|g^3|$
   d. $6g^4$

4. $\sqrt[3]{27x^{15}y^{24}}$
   a. $3x^5|y^8|$
   b. $9x^{15}|y^{24}|$
   c. $3x^5y^8$
   d. $9|x^{15}|y^{24}$

Multiply and simplify if possible.

5. $\sqrt{7x}\left(\sqrt{x} - 7\sqrt{7}\right)$
   a. $x\sqrt{7} - 49\sqrt{x}$
   b. $\sqrt{7x} - 49x$
   c. $x\sqrt{7} - x\sqrt{49}$
   d. $-\sqrt{42x}$

What is the simplest form of the expression?

6. $\sqrt[3]{128a^{13}b^6}$
   a. $4a^4b^2\sqrt[3]{2a}$
   b. $2a^4b^2\sqrt[3]{4a}$
   c. $4a^4b\sqrt[3]{a}$
   d. none of these

Name: _____ **ID: A**

What is the simplest form of the product?

7. $\sqrt[3]{7x^7} \cdot \sqrt[3]{9x^4}$
   a. $x^3 \cdot \sqrt[3]{63x^2}$
   b. $\sqrt[3]{63x^{11}}$
   c. $x^3 \cdot \sqrt[3]{63x^{11}}$
   d. none of these

8. $\dfrac{\sqrt[3]{270x^{20}}}{\sqrt[3]{5x}}$
   a. $2x\sqrt[3]{3x^6}$
   b. $3x^6\sqrt[3]{2x}$
   c. $\sqrt[3]{135x^{19}}$
   d. $3x^6\sqrt{135x}$

9. $\dfrac{\sqrt[3]{9}}{\sqrt[3]{11}}$
   a. $\dfrac{\sqrt[3]{99}}{11}$
   b. $\dfrac{\sqrt[3]{1089}}{11}$
   c. $11\sqrt[3]{99}$
   d. none of these

What is the simplest form of the radical expression?

10. $2\sqrt[4]{2x} + 6\sqrt[4]{2x}$
    a. $8\sqrt[4]{4x}$
    b. $16\sqrt[4]{2x}$
    c. $8\sqrt[4]{2x}$
    d. not possible to simplify

What is the simplest form of the expression?

11. $\sqrt[3]{48} + \sqrt[3]{2058} - \sqrt[3]{750}$
    a. $4\sqrt[3]{6}$
    b. $14\sqrt[3]{6}$
    c. $2.8\sqrt[3]{6}$
    d. $9\sqrt[3]{6}$

What is the product of the radical expression?

12. $\left(7 - \sqrt{2}\right)\left(8 + \sqrt{2}\right)$
    a. $54 + 56\sqrt{2}$
    b. $54 - \sqrt{2}$
    c. $13 + 15\sqrt{2}$
    d. $58 + 56\sqrt{2}$

How can you write the expression with rationalized denominator?

13. $\dfrac{\sqrt{3} - \sqrt{6}}{\sqrt{3} + \sqrt{6}}$
    a. $\dfrac{-1 - 2\sqrt{18}}{3}$
    b. $\dfrac{-3 - 2\sqrt{18}}{9}$
    c. $-3 + 2\sqrt{2}$
    d. $9 - 2\sqrt{18}$

14. $\dfrac{2 + \sqrt[3]{3}}{\sqrt[3]{6}}$

a. $\dfrac{2\sqrt[3]{6} + 9\sqrt[3]{18}}{6}$

b. $\dfrac{2\sqrt[3]{36} + 3\sqrt[3]{2}}{6}$

c. $\dfrac{2\sqrt[3]{6} + 9\sqrt[3]{4}}{6}$

d. $\dfrac{2\sqrt[3]{36} + 3\sqrt[3]{4}}{6}$

Simplify.

15. $3^{\frac{1}{3}} \cdot 9^{\frac{1}{3}}$

a. 9

b. $\sqrt[3]{3}$

c. 3

d. $\sqrt{3}$

16. Write the exponential expression $3x^{\frac{3}{8}}$ in radical form.

a. $3\sqrt[8]{x^3}$

b. $\sqrt[8]{3x^3}$

c. $3\sqrt[3]{x^8}$

d. $3^{\frac{3}{8}}\sqrt[8]{x^3}$

17. Write the radical expression $\dfrac{8}{\sqrt[7]{x^{15}}}$ in exponential form.

a. $8x^{-\frac{7}{15}}$

b. $8x^{\frac{15}{7}}$

c. $8x^{-\frac{15}{7}}$

d. $8x^{\frac{7}{15}}$

What is the simplest form of the number?

18. $\sqrt{2}\left(\sqrt[8]{2}\right)$

a. 1024

b. $2^{\frac{5}{8}}$

c. $2^{\frac{8}{5}}$

d. $2^{\frac{1}{10}}$

19. $-27^{\frac{2}{3}}$

a. 9

b. 57

c. –28

d. –18

20. Write $(8a^{-3})^{-\frac{2}{3}}$ in simplest form.

a. $\dfrac{a^2}{4}$

b. $4a^2$

c. $\dfrac{1}{4a^2}$

d. none of these

What is the solution of the equation?

21. $-10 + \sqrt{x + 8} = -4$
    a. 36
    b. 28
    c. –2
    d. 44

22. $2\sqrt[5]{(x + 6)^3} + 3 = 19$
    a. 26
    b. 14
    c. 38
    d. 2

23. $4(3 - x)^{\frac{4}{3}} - 5 = 59$
    a. –5, 11
    b. 5
    c. 11
    d. –11

What is the solution of the equation? Eliminate any extraneous solutions.

24. $(-2x + 6)^{\frac{1}{5}} = (-8 + 10x)^{\frac{1}{5}}$
    a. $\frac{7}{6}$
    b. $\frac{2}{3}$
    c. $-\frac{1}{4}$
    d. $\frac{6}{7}$

25. Let $f(x) = -5x - 4$ and $g(x) = 6x - 7$. Find $f(x) + g(x)$.
    a. $-11x + 3$
    b. $x + 3$
    c. $-11x - 11$
    d. $x - 11$

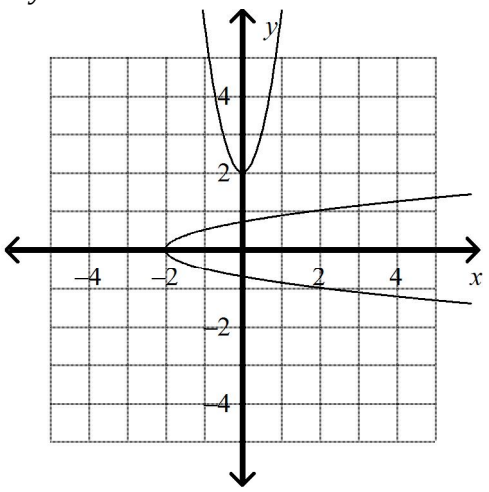
26. Let $f(x) = 4x - 5$ and $g(x) = 6x - 3$. Find $f(x) - g(x)$.
    a. $10x - 8$
    b. $10x - 2$
    c. $-2x - 8$
    d. $-2x - 2$

27. Let $f(x) = 3x + 2$ and $g(x) = 7x + 6$. Find $f \cdot g$ and its domain.
    a. $6x^2 + 4x + 42$; all real numbers except $x = -\frac{2}{3}$
    b. $6x^2 + 4x + 42$; all real numbers
    c. $21x^2 + 32x + 12$; all real numbers
    d. $21x^2 + 32x + 12$; all real numbers except $x = -\frac{6}{7}$

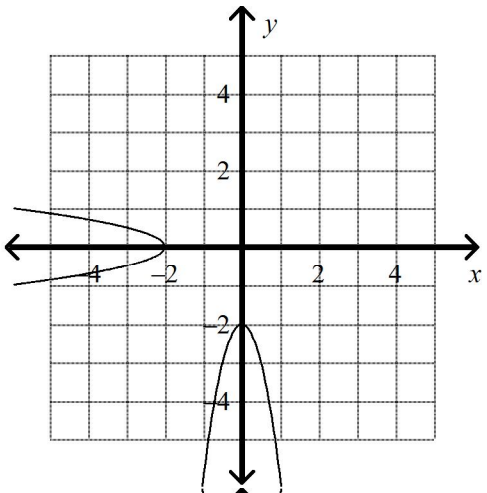
28. Let $f(x) = 3x - 6$ and $g(x) = x - 2$. Find $\frac{f}{g}$ and its domain.
    a. 3; all real numbers
    b. 3; all real numbers except $x = 2$
    c. 1; all real numbers
    d. –3; all real numbers except $x = 3$

29. Let $f(x) = -2x - 7$ and $g(x) = -4x + 3$. Find $(f \circ g)(-5)$.
    a. 23
    b. –53
    c. –9
    d. 3

30. Graph $y = -4x^2 - 2$ and its inverse.
    a.



b.



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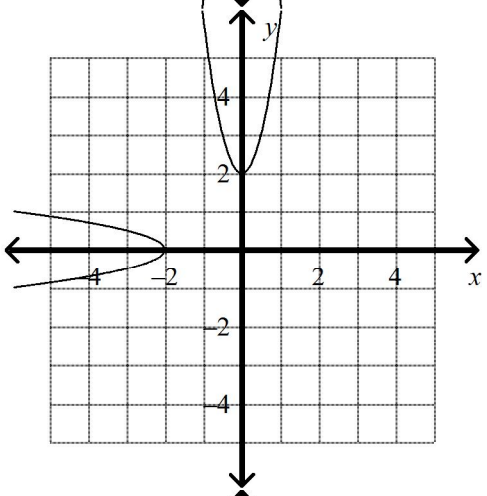
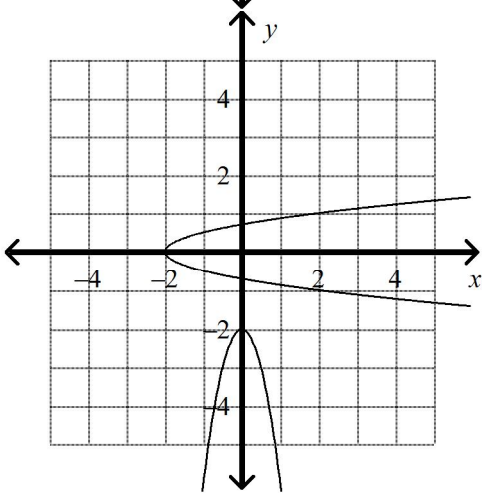


d.



31. For the function $f(x) = (8 - 2x)^2$, find f^{-1}. Determine whether f^{-1} is a function.

    a. $f^{-1}(x) = \pm\sqrt{\dfrac{8 + x}{2}}$; f^{-1} is not a function.

    b. $f^{-1}(x) = \dfrac{8 \pm \sqrt{x}}{2}$; f^{-1} is not a function.

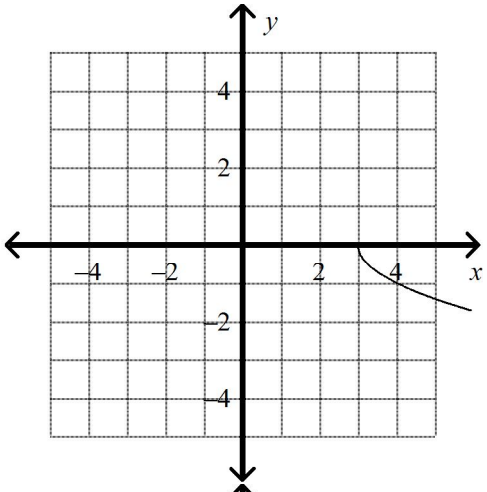
    c. $f^{-1}(x) = \pm\sqrt{\dfrac{8 + x}{2}}$; f^{-1} is a function.

    d. $f^{-1}(x) = \dfrac{8 \pm \sqrt{x}}{2}$; f^{-1} is a function.

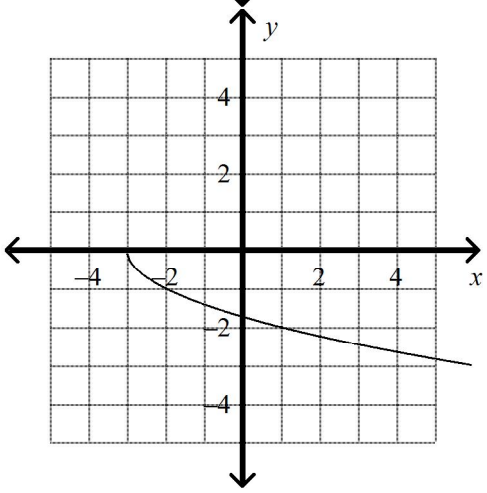
32. For the function $f(x) = x + 9$, find $(f \circ f^{-1})(5)$.
    a. 14
    b. 5
    c. –5
    d. 25

33. $y = \sqrt{x + 3}$

    a.



    b.



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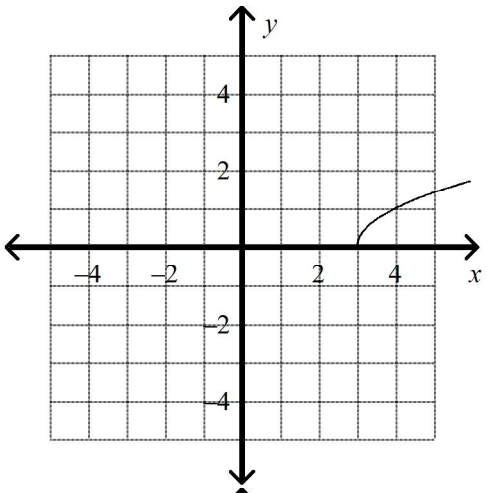
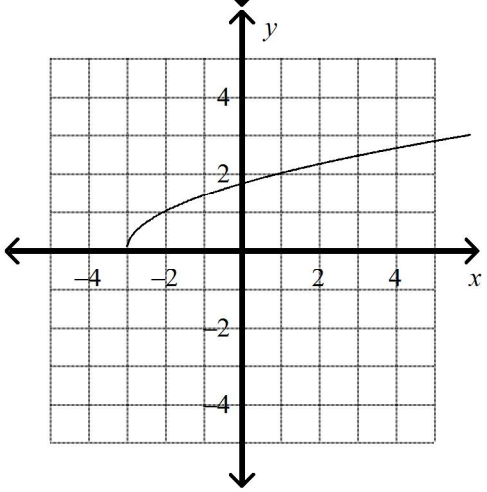
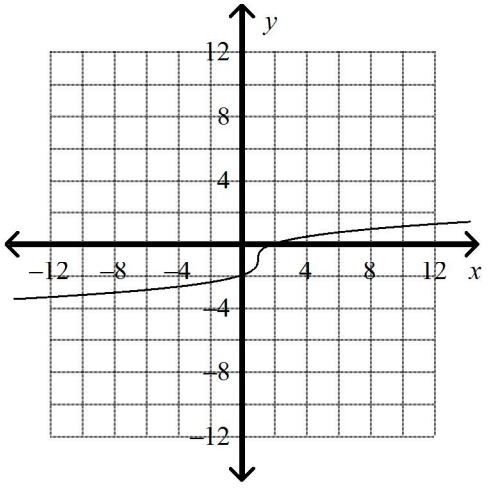


d.

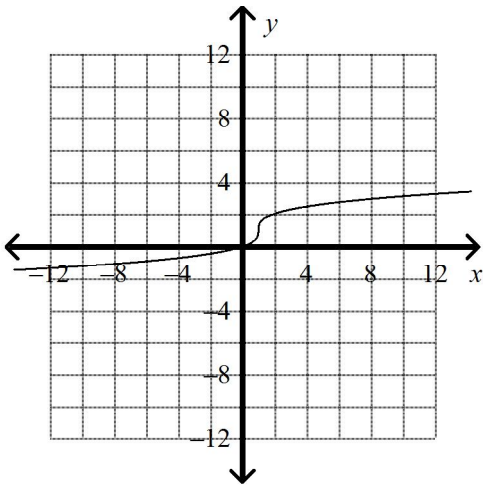


34. $y = \sqrt[3]{x - 1} + 1$

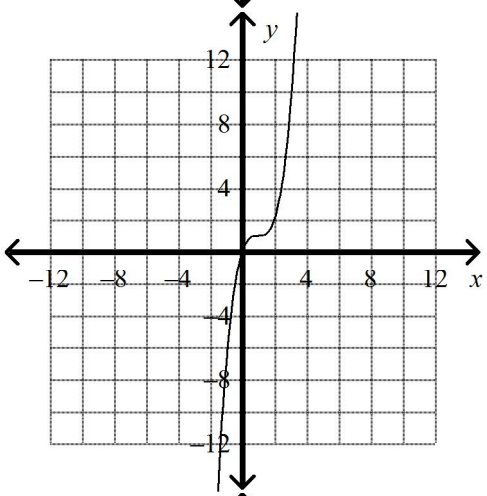
a.



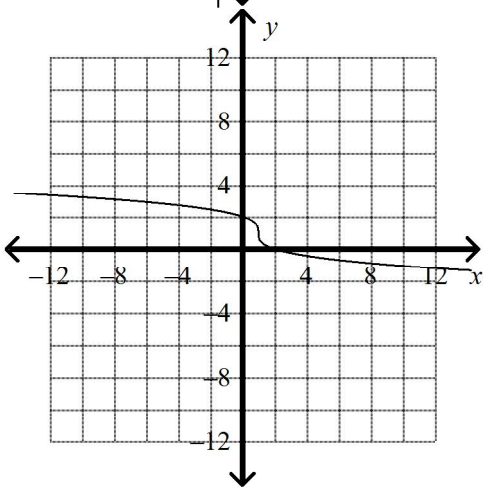
b.



c.



d.



35. Rewrite $y = \sqrt[3]{64x - 320} - 2$ to make it easy to graph using a translation. Describe the graph.

    a. $y = 4\sqrt[3]{x - 5} - 2$.

    It is the graph of $y = 4\sqrt[3]{x}$ translated 5 units left and 2 units down.

    b. $y = 4\sqrt[3]{x - 5} - 2$.

    It is the graph of $y = 4\sqrt[3]{x}$ translated 5 units right and 2 units down.

    c. $y = \sqrt[3]{x - 5} - 2$. It is the graph of $y = \sqrt[3]{x}$ translated 5 units left and 2 units down.

    d. $y = \sqrt[3]{x + 5} - 2$.

    It is the graph of $y = \sqrt[3]{x}$ translated 5 units right and 2 units down.

Algebra 2 - Chapter 6 Test Review
Answer Section

MULTIPLE CHOICE

1. ANS: B PTS: 1 DIF: L4 REF: 6-1 Roots and Radical Expressions
   OBJ: 6-1.1 To find nth roots NAT: CC A.SSE.2| A.3.e
   TOP: 6-1 Problem 1 Finding All Real Roots KEY: nth root
2. ANS: D PTS: 1 DIF: L3 REF: 6-1 Roots and Radical Expressions
   OBJ: 6-1.1 To find nth roots NAT: CC A.SSE.2| A.3.e
   TOP: 6-1 Problem 2 Finding Roots KEY: radicand | index | nth root
3. ANS: C PTS: 1 DIF: L2 REF: 6-1 Roots and Radical Expressions
   OBJ: 6-1.1 To find nth roots NAT: CC A.SSE.2| A.3.e
   TOP: 6-1 Problem 3 Simplifying Radical Expressions KEY: radicand | index | nth root
4. ANS: C PTS: 1 DIF: L3 REF: 6-1 Roots and Radical Expressions
   OBJ: 6-1.1 To find nth roots NAT: CC A.SSE.2| A.3.e
   TOP: 6-1 Problem 3 Simplifying Radical Expressions KEY: radicand | index | nth root
5. ANS: A PTS: 1 DIF: L4
   REF: 6-2 Multiplying and Dividing Radical Expressions
   OBJ: 6-2.1 To multiply and divide radical expressions NAT: CC A.SSE.2| N.5.e| A.3.c| A.3.e
   TOP: 6-2 Problem 1 Multiplying Radical Expressions
6. ANS: A PTS: 1 DIF: L3
   REF: 6-2 Multiplying and Dividing Radical Expressions
   OBJ: 6-2.1 To multiply and divide radical expressions NAT: CC A.SSE.2| N.5.e| A.3.c| A.3.e
   TOP: 6-2 Problem 2 Simplifying a Radical Expression KEY: simplest form of a radical
7. ANS: A PTS: 1 DIF: L3
   REF: 6-2 Multiplying and Dividing Radical Expressions
   OBJ: 6-2.1 To multiply and divide radical expressions NAT: CC A.SSE.2| N.5.e| A.3.c| A.3.e
   TOP: 6-2 Problem 3 Simplifying a Product KEY: simplest form of a radical
8. ANS: B PTS: 1 DIF: L3
   REF: 6-2 Multiplying and Dividing Radical Expressions
   OBJ: 6-2.1 To multiply and divide radical expressions NAT: CC A.SSE.2| N.5.e| A.3.c| A.3.e
   TOP: 6-2 Problem 4 Dividing Radical Expressions KEY: simplest form of a radical
9. ANS: B PTS: 1 DIF: L2
   REF: 6-2 Multiplying and Dividing Radical Expressions
   OBJ: 6-2.1 To multiply and divide radical expressions NAT: CC A.SSE.2| N.5.e| A.3.c| A.3.e
   TOP: 6-2 Problem 5 Rationalizing the Denominator KEY: rationalizing the denominator
10. ANS: C PTS: 1 DIF: L2 REF: 6-3 Binomial Radical Expressions
    OBJ: 6-3.1 To add and subtract radical expressions NAT: CC A.SSE.2| N.5.e| A.3.c| A.3.e
    TOP: 6-3 Problem 1 Adding and Subtracting Radical Expressions
    KEY: like radicals
11. ANS: A PTS: 1 DIF: L4 REF: 6-3 Binomial Radical Expressions
    OBJ: 6-3.1 To add and subtract radical expressions NAT: CC A.SSE.2| N.5.e| A.3.c| A.3.e
    TOP: 6-3 Problem 3 Simplifying Before Adding or Subtracting KEY: like radicals

12. ANS: B PTS: 1 DIF: L2 REF: 6-3 Binomial Radical Expressions
OBJ: 6-3.1 To add and subtract radical expressions NAT: CC A.SSE.2| N.5.e| A.3.c| A.3.e
TOP: 6-3 Problem 4 Multiplying Binomial Radical Expressions KEY: like radicals
13. ANS: C PTS: 1 DIF: L3 REF: 6-3 Binomial Radical Expressions
OBJ: 6-3.1 To add and subtract radical expressions NAT: CC A.SSE.2| N.5.e| A.3.c| A.3.e
TOP: 6-3 Problem 6 Rationalizing the Denominator KEY: like radicals
14. ANS: D PTS: 1 DIF: L2 REF: 6-3 Binomial Radical Expressions
OBJ: 6-3.1 To add and subtract radical expressions NAT: CC A.SSE.2| N.5.e| A.3.c| A.3.e
TOP: 6-3 Problem 6 Rationalizing the Denominator KEY: like radicals
15. ANS: C PTS: 1 DIF: L3 REF: 6-4 Rational Exponents
OBJ: 6-4.1 To simplify expressions with rational exponents NAT: CC N.RN.1| CC N.RN.2
TOP: 6-4 Problem 1 Simplifying Expressions with Rational Exponents
KEY: rational exponents
16. ANS: A PTS: 1 DIF: L2 REF: 6-4 Rational Exponents
OBJ: 6-4.1 To simplify expressions with rational exponents NAT: CC N.RN.1| CC N.RN.2
TOP: 6-4 Problem 2 Converting Between Exponential and Radical Form
KEY: rational exponents
17. ANS: C PTS: 1 DIF: L4 REF: 6-4 Rational Exponents
OBJ: 6-4.1 To simplify expressions with rational exponents NAT: CC N.RN.1| CC N.RN.2
TOP: 6-4 Problem 2 Converting Between Exponential and Radical Form
KEY: rational exponents
18. ANS: B PTS: 1 DIF: L3 REF: 6-4 Rational Exponents
OBJ: 6-4.1 To simplify expressions with rational exponents NAT: CC N.RN.1| CC N.RN.2
TOP: 6-4 Problem 4 Combining Radical Expressions KEY: rational exponent
19. ANS: A PTS: 1 DIF: L3 REF: 6-4 Rational Exponents
OBJ: 6-4.1 To simplify expressions with rational exponents NAT: CC N.RN.1| CC N.RN.2
TOP: 6-4 Problem 5 Simplifying Numbers With Rational Exponents
KEY: rational exponent
20. ANS: A PTS: 1 DIF: L4 REF: 6-4 Rational Exponents
OBJ: 6-4.1 To simplify expressions with rational exponents NAT: CC N.RN.1| CC N.RN.2
TOP: 6-4 Problem 6 Writing Expressions in Simplest form KEY: rational exponents
21. ANS: B PTS: 1 DIF: L2
REF: 6-5 Solving Square Root and Other Radical Equations
OBJ: 6-5.1 To solve square root and other radical equations NAT: CC A.CED.4| CC A.REI.2| A.2.a
TOP: 6-5 Problem 1 Solving a Square Root Equation KEY: square root equation
22. ANS: A PTS: 1 DIF: L3
REF: 6-5 Solving Square Root and Other Radical Equations
OBJ: 6-5.1 To solve square root and other radical equations NAT: CC A.CED.4| CC A.REI.2| A.2.a
TOP: 6-5 Problem 2 Solving Other Radical Equations KEY: radical equation
23. ANS: A PTS: 1 DIF: L4
REF: 6-5 Solving Square Root and Other Radical Equations
OBJ: 6-5.1 To solve square root and other radical equations NAT: CC A.CED.4| CC A.REI.2| A.2.a
TOP: 6-5 Problem 2 Solving Other Radical Equations KEY: radical equation
24. ANS: A PTS: 1 DIF: L4
REF: 6-5 Solving Square Root and Other Radical Equations
OBJ: 6-5.1 To solve square root and other radical equations NAT: CC A.CED.4| CC A.REI.2| A.2.a
TOP: 6-5 Problem 4 Checking for Extraneous Solutions KEY: radical equation | extraneous solution

25. ANS: D PTS: 1 DIF: L3 REF: 6-6 Function Operations
OBJ: 6-6.1 To add, subtract, multiply, and divide functions NAT: CC F.BF.1| CC F.BF.1.b| A.3.f
TOP: 6-6 Problem 1 Adding and Subtracting Functions

26. ANS: D PTS: 1 DIF: L3 REF: 6-6 Function Operations
OBJ: 6-6.1 To add, subtract, multiply, and divide functions NAT: CC F.BF.1| CC F.BF.1.b| A.3.f
TOP: 6-6 Problem 1 Adding and Subtracting Functions

27. ANS: C PTS: 1 DIF: L3 REF: 6-6 Function Operations
OBJ: 6-6.1 To add, subtract, multiply, and divide functions NAT: CC F.BF.1| CC F.BF.1.b| A.3.f
TOP: 6-6 Problem 2 Multiplying and Dividing Functions

28. ANS: B PTS: 1 DIF: L3 REF: 6-6 Function Operations
OBJ: 6-6.1 To add, subtract, multiply, and divide functions NAT: CC F.BF.1| CC F.BF.1.b| A.3.f
TOP: 6-6 Problem 2 Multiplying and Dividing Functions

29. ANS: B PTS: 1 DIF: L3 REF: 6-6 Function Operations
OBJ: 6-6.2 To find the composite of two functions NAT: CC F.BF.1| CC F.BF.1.b| A.3.f
TOP: 6-6 Problem 3 Composing Functions KEY: composite function

30. ANS: B PTS: 1 DIF: L3 REF: 6-7 Inverse Relations and Functions
OBJ: 6-7.1 To find the inverse of a relation or function NAT: CC F.BF.4.a| CC F.BF.4.c| A.1.j
TOP: 6-7 Problem 3 Graphing a Relation and Its Inverse KEY: inverse relation

31. ANS: B PTS: 1 DIF: L3 REF: 6-7 Inverse Relations and Functions
OBJ: 6-7.1 To find the inverse of a relation or function NAT: CC F.BF.4.a| CC F.BF.4.c| A.1.j
TOP: 6-7 Problem 4 Finding an Inverse Function KEY: inverse function

32. ANS: B PTS: 1 DIF: L2 REF: 6-7 Inverse Relations and Functions
OBJ: 6-7.1 To find the inverse of a relation or function NAT: CC F.BF.4.a| CC F.BF.4.c| A.1.j
TOP: 6-7 Problem 6 Composing Inverse Functions
KEY: rearrange formulas to highlight a quantity | composition of functions | inverse relations and functions

33. ANS: D PTS: 1 DIF: L2 REF: 6-8 Graphing Radical Functions
OBJ: 6-8.1 To graph square root and other radical functions NAT: CC F.IF.7| CC F.IF.7.b| CC F.IF.8| G.2.c
TOP: 6-8 Problem 2 Translating a Square Root Function Horizontally
KEY: square root function

34. ANS: B PTS: 1 DIF: L3 REF: 6-8 Graphing Radical Functions
OBJ: 6-8.1 To graph square root and other radical functions NAT: CC F.IF.7| CC F.IF.7.b| CC F.IF.8| G.2.c
TOP: 6-8 Problem 5 Graphing a Cube Root Function KEY: radical function

35. ANS: B PTS: 1 DIF: L3 REF: 6-8 Graphing Radical Functions
OBJ: 6-8.1 To graph square root and other radical functions NAT: CC F.IF.7| CC F.IF.7.b| CC F.IF.8| G.2.c
TOP: 6-8 Problem 6 Rewriting a Radical Function KEY: radical function