Name: _____ **Class:** _____ **Date:** _____ **ID: X**

Alg 2 Topic 5 Test Practice

____ 1. Find all the real square roots of 144.

a. 12
b. 12 and –12
c. –12
d. $12i$ and $-12i$

____ 2. Find all the real square roots of $-\frac{9}{16}$.

a. no real root
b. $-\frac{3}{4}$
c. $-\frac{3}{4}$ and $\frac{3}{4}$
d. $\frac{81}{256}$

____ 3. Find all the real cube roots of 27.

a. –3 and 3
b. 3
c. $3i$
d. $3i$ and $-3i$

Which is a simpler form of the radical expression?

____ 4. $\sqrt[4]{81x^{20}y^8}$

a. $3|x^5|y^2$
b. $9|x^{25}|y^4$
c. $9x^{25}|y^4|$
d. $3x^5|y^2|$

____ 5. $\sqrt[3]{27x^{15}y^{24}}$

a. $3x^5|y^8|$
b. $9x^{15}|y^{24}|$
c. $3x^5y^8$
d. $9|x^{15}|y^{24}$

____ 6. 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. $3^{\frac{3}{8}}\sqrt[8]{x^3}$

____ 7. Write the radical expression $\frac{8}{\sqrt[7]{x^{15}}}$ 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?

____ 8. $-27^{\frac{2}{3}}$

a. 9
b. 57
c. –28
d. –18

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____ 9. $\sqrt{2}\left(\sqrt[8]{2}\right)$

a. 1024
b. $2^{\frac{5}{8}}$
c. $2^{\frac{8}{5}}$
d. $2^{\frac{1}{10}}$

____ 10. Write $(8a^{-3})^{-\frac{2}{3}}$ in simplest form.

a. $\frac{a^2}{4}$
b. $4a^2$
c. $\frac{1}{4a^2}$
d. none of these

____ 11. What is $\frac{\sqrt[3]{x^3}}{\sqrt[5]{x^2}}$ in simplest form?

a. $x^{\frac{3}{5}}$
b. $x^{\frac{5}{3}}$
c. $x^{\frac{9}{15}}$
d. $x^{\frac{15}{9}}$

What is the simplest form of the expression?

____ 12. $\sqrt[3]{108a^{16}b^9}$

a. $3a^5b^3\sqrt[3]{4a}$
b. $4a^5b^3\sqrt[3]{3a}$
c. $3a^5b\sqrt[3]{a}$
d. none of these

Multiply and simplify if possible.

____ 13. $\sqrt{6} \cdot \sqrt{2}$

a. $2\sqrt{3}$
b. $\sqrt{12}$
c. $3\sqrt{2}$
d. not possible

____ 14. $\sqrt{7x}\left(\sqrt{x} - 7\sqrt{7}\right)$

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 product?

____ 15. $\sqrt{50x^7y^7} \cdot \sqrt{6xy^4}$

a. $2x^4y^6\sqrt{75y}$
b. $10x^4y^5\sqrt{3y}$
c. $5x^4y^6\sqrt{12}$
d. $30x^4y^5\sqrt{y}$

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____ 16. $\dfrac{\sqrt[3]{270x^{20}}}{\sqrt[3]{5x}}$

a. $2x\sqrt[3]{3x^6}$ b. $3x^6\sqrt[3]{2x}$ c. $\sqrt[3]{135x^{19}}$ d. $3x^6\sqrt{135x}$

____ 17. $\dfrac{\sqrt[3]{9}}{\sqrt[3]{11}}$

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?

____ 18. $3\sqrt{2a} - 6\sqrt{2a}$

a. $-6\sqrt{2a}$ c. $-3\sqrt{2a}$

b. $9\sqrt{2a}$ d. not possible to simplify

What is the simplest form of the expression?

____ 19. $\sqrt{20} + \sqrt{45} - \sqrt{5}$

a. $4\sqrt{5}$ c. $13\sqrt{5}$

b. $6\sqrt{5}$ d. $5\sqrt{5}$

What is the product of the radical expression?

____ 20. $\left(7 - \sqrt{2}\right)\left(8 + \sqrt{2}\right)$

a. $54 + 56\sqrt{2}$ c. $13 + 15\sqrt{2}$

b. $54 - \sqrt{2}$ d. $58 + 56\sqrt{2}$

____ 21. $\left(5 - \sqrt{2}\right)\left(5 + \sqrt{2}\right)$

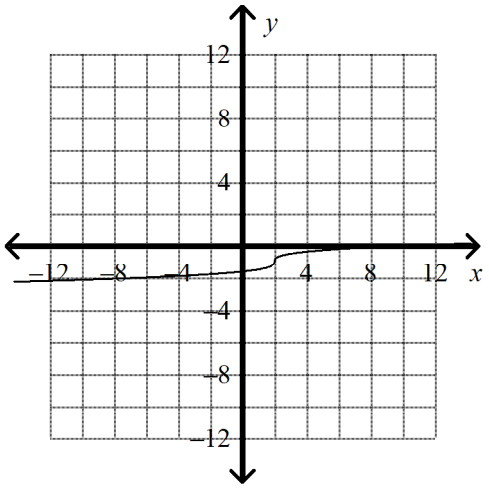
a. 23 c. 27

b. 20 d. 18

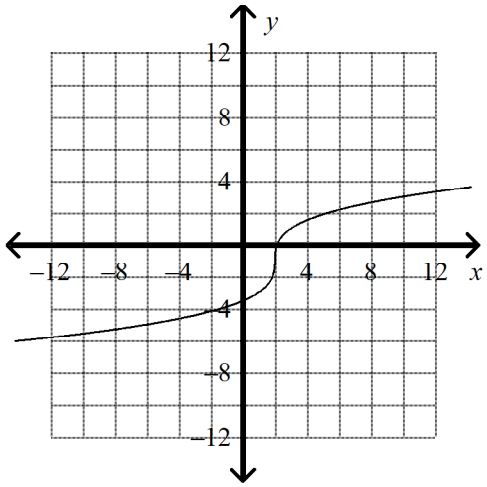
Name: _____ **ID: X**

____ 22. $y = 1 + \frac{1}{2}\sqrt[3]{x-2}$

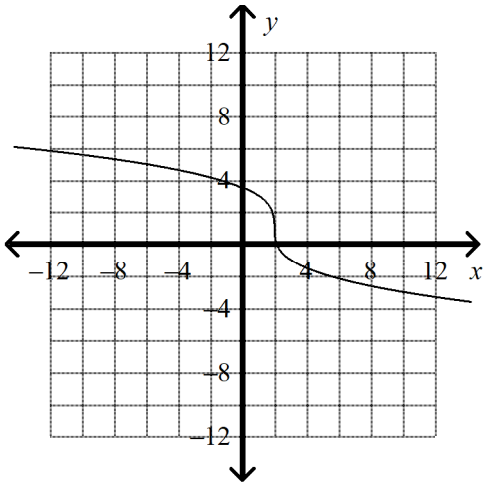
a.



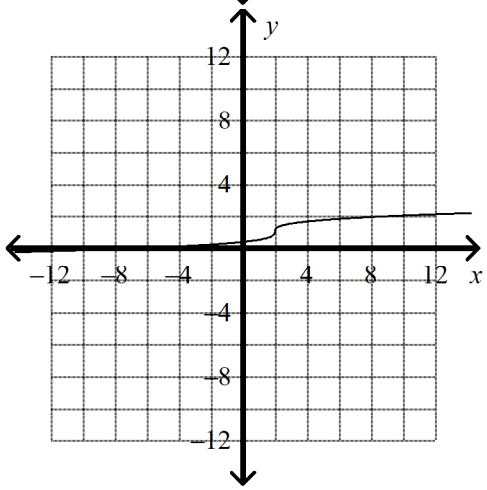
c.



b.



d.



What is the solution of the equation?

____ 23. $\sqrt{x+10} - 7 = -5$

a. 14 b. –8 c. 4 d. –6

____ 24. $(x+6)^{\frac{3}{5}} = 8$

a. 14 b. 2 c. 26 d. 38

____ 25. What is the solution of $\sqrt{5x+1} - \sqrt{x} = 5$?

a. $x = 0$
b. $x = 16$ and $x = 0$
c. $x = 16$
d. $x = 16$ and $x = 1$

____ 26. Let $f(x) = 3x + 2$ and $g(x) = x - 3$. Find $f(x) - g(x)$.

a. $2x - 5$ b. $2x + 5$ c. $4x - 1$ d. $2x - 1$

____ 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 $f(x) = x^2 - 16$ and $g(x) = x + 4$. Find $\frac{f}{g}$ and its domain.

a. $x + 4$; all real numbers except $x \neq 4$

b. $x + 4$; all real numbers except $x \neq -4$

c. $x - 4$; all real numbers except $x \neq 4$

d. $x - 4$; all real numbers except $x \neq -4$

____ 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. Is relation *t* a function? Is the inverse of relations *t* a function?

Relation *t*

x	0	2	4	6
y	–8	–7	–4	–4

a. Relation *t* is not a function. The inverse of relation *t* is a function.

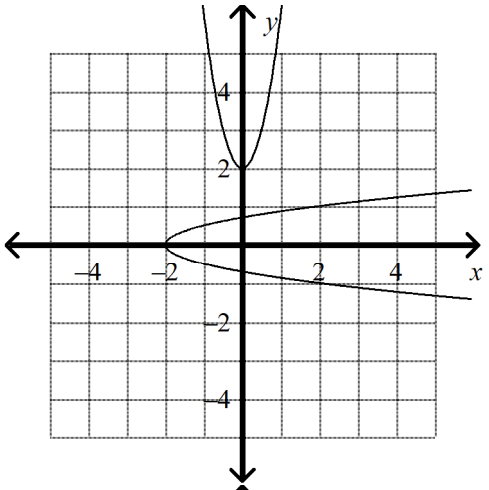
b. Relation *t* is not a function. The inverse of relation *t* is not a function.

c. Relation *t* is not a function. The inverse of relation *t* is a function.

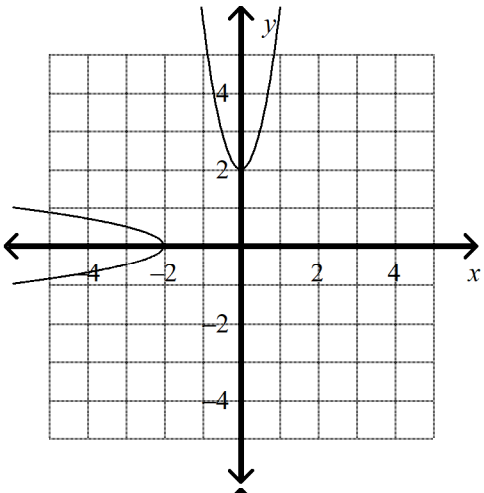
d. Relation *t* is a function. The inverse of relation *t* is not a function.

____ 31. Graph $y = -4x^2 - 2$ and its inverse.

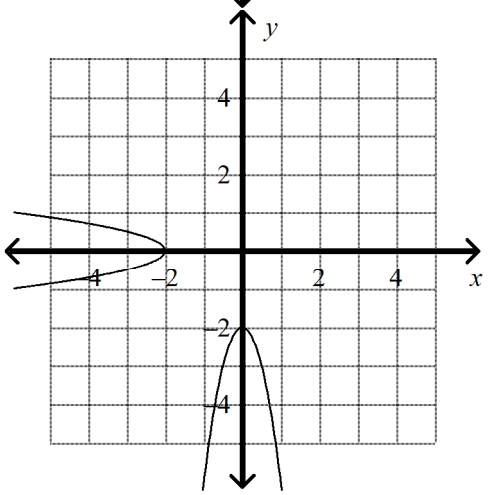
a.



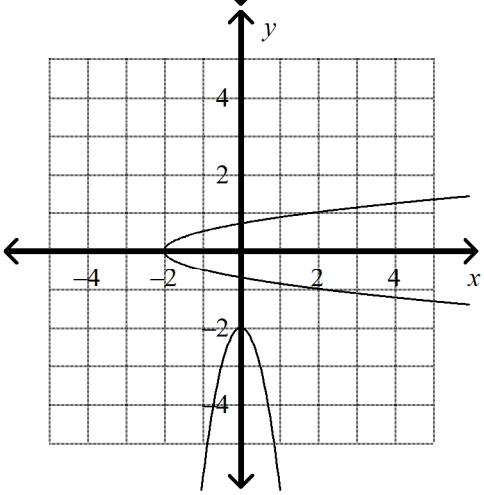
c.



b.



d.



What is the inverse of the given relation?

____ 32. $y = 7x^2 - 3$.

a. $y = \pm\sqrt{\dfrac{x+3}{7}}$

c. $y^2 = \dfrac{x-3}{7}$

b. $x = \sqrt{\dfrac{y+3}{7}}$

d. $y = \pm\sqrt{\dfrac{x-3}{7}}$

____ 33. For the function $f(x) = \sqrt{x-5}$, find f^{-1}. What is the range of f^{-1}?

a. $f^{-1}(x) = x^2 + 25;\ y \geq 25$

b. $f^{-1}(x) = x^2 + 25;\ y \geq 5$

c. $f^{-1}(x) = x^2 + 5;\ y \geq 25$

d. $f^{-1}(x) = x^2 + 5;\ y \geq 5$

Alg 2 Topic 5 Test Practice
Answer Section

1. ANS: B PTS: 1 DIF: L4
   REF: 5-1 nth Roots, Radicals, and Rational Exponents
   OBJ: 5-1.1 Find all real nth roots of a number. NAT: HSA.SSE.A.2
   TOP: 5-1 Example 1 Find All Real nth Roots KEY: nth root
2. ANS: A PTS: 1 DIF: L2
   REF: 5-1 nth Roots, Radicals, and Rational Exponents
   OBJ: 5-1.1 Find all real nth roots of a number. NAT: HSA.SSE.A.2
   TOP: 5-1 Example 1 Find All Real nth Roots KEY: nth root
3. ANS: B PTS: 1 DIF: L4
   REF: 5-1 nth Roots, Radicals, and Rational Exponents
   OBJ: 5-1.1 Find all real nth roots of a number. NAT: HSA.SSE.A.2
   TOP: 5-1 Example 1 Find All Real nth Roots KEY: nth root
4. ANS: A PTS: 1 DIF: L3
   REF: 5-1 nth Roots, Radicals, and Rational Exponents
   OBJ: 5-1.2 Evaluate expressions with rational exponents. NAT: HSA.SSE.A.2
   TOP: 5-1 Example 2 Understand Rational Exponents KEY: radicand | index | nth root
5. ANS: C PTS: 1 DIF: L3
   REF: 5-1 nth Roots, Radicals, and Rational Exponents
   OBJ: 5-1.2 Evaluate expressions with rational exponents. NAT: HSA.SSE.A.2
   TOP: 5-1 Example 2 Understand Rational Exponents KEY: radicand | index | nth root
6. ANS: A PTS: 1 DIF: L2
   REF: 5-1 nth Roots, Radicals, and Rational Exponents
   OBJ: 5-1.2 Evaluate expressions with rational exponents. NAT: HSN.RN.A.1| HSN.RN.A.2
   TOP: 5-1 Example 2 Understand Rational Exponents KEY: rational exponents
7. ANS: C PTS: 1 DIF: L4
   REF: 5-1 nth Roots, Radicals, and Rational Exponents
   OBJ: 5-1.2 Evaluate expressions with rational exponents. NAT: HSN.RN.A.1| HSN.RN.A.2
   TOP: 5-1 Example 2 Understand Rational Exponents KEY: rational exponents
8. ANS: A PTS: 1 DIF: L3
   REF: 5-1 nth Roots, Radicals, and Rational Exponents
   OBJ: 5-1.2 Evaluate expressions with rational exponents. NAT: HSN.RN.A.1| HSN.RN.A.2
   TOP: 5-1 Example 3 Evaluate Expressions with Rational Exponents
   KEY: rational exponent
9. ANS: B PTS: 1 DIF: L3
   REF: 5-1 nth Roots, Radicals, and Rational Exponents
   OBJ: 5-1.2 Evaluate expressions with rational exponents. NAT: HSN.RN.A.1| HSN.RN.A.2
   TOP: 5-1 Example 4 Simplify nth Roots KEY: rational exponent
10. ANS: A PTS: 1 DIF: L4
    REF: 5-1 nth Roots, Radicals, and Rational Exponents
    OBJ: 5-1.2 Evaluate expressions with rational exponents. NAT: HSN.RN.A.1| HSN.RN.A.2
    TOP: 5-1 Example 3 Evaluate Expressions with Rational Exponents
    KEY: rational exponents

11. ANS: A PTS: 1 DIF: L3
REF: 5-1 nth Roots, Radicals, and Rational Exponents
OBJ: 5-1.2 Evaluate expressions with rational exponents. NAT: HSN.RN.A.1| HSN.RN.A.2
TOP: 5-1 Example 4 Simplify nth Roots KEY: rational exponent
12. ANS: A PTS: 1 DIF: L3
REF: 5-2 Properties of Exponents and Radicals
OBJ: 5-2.1 Use the properties of exponents and radicals to identify ways to rewrite radical expressions.
NAT: HSA.SSE.A.2
TOP: 5-2 Example 2 Use Properties of Exponents to Rewrite Radicals
KEY: simplest form of a radical
13. ANS: A PTS: 1 DIF: L2
REF: 5-2 Properties of Exponents and Radicals
OBJ: 5-2.1 Use the properties of exponents and radicals to identify ways to rewrite radical expressions.
NAT: HSA.SSE.A.2
TOP: 5-2 Example 3 Rewrite the Product or Quotient of a Radical
14. ANS: A PTS: 1 DIF: L4
REF: 5-2 Properties of Exponents and Radicals
OBJ: 5-2.1 Use the properties of exponents and radicals to identify ways to rewrite radical expressions.
NAT: HSA.SSE.A.2 TOP: 5-2 Example 5 Multiply Binomial Radical Expressions
15. ANS: B PTS: 1 DIF: L3
REF: 5-2 Properties of Exponents and Radicals
OBJ: 5-2.1 Use the properties of exponents and radicals to identify ways to rewrite radical expressions.
NAT: HSA.SSE.A.2
TOP: 5-2 Example 3 Rewrite the Product or Quotient of a Radical
KEY: simplest form of a radical
16. ANS: B PTS: 1 DIF: L3
REF: 5-2 Properties of Exponents and Radicals
OBJ: 5-2.1 Use the properties of exponents and radicals to identify ways to rewrite radical expressions.
NAT: HSA.SSE.A.2
TOP: 5-2 Example 3 Rewrite the Product or Quotient of a Radical
KEY: simplest form of a radical
17. ANS: B PTS: 1 DIF: L2
REF: 5-2 Properties of Exponents and Radicals
OBJ: 5-2.1 Use the properties of exponents and radicals to identify ways to rewrite radical expressions.
NAT: HSA.SSE.A.2
TOP: 5-2 Example 3 Rewrite the Product or Quotient of a Radical
KEY: rationalizing the denominator
18. ANS: C PTS: 1 DIF: L2
REF: 5-2 Properties of Exponents and Radicals
OBJ: 5-2.1 Use the properties of exponents and radicals to identify ways to rewrite radical expressions.
NAT: HSA.SSE.A.2 TOP: 5-2 Example 4 Add and Subtract Radical Expressions
KEY: like radicals
19. ANS: A PTS: 1 DIF: L3
REF: 5-2 Properties of Exponents and Radicals
OBJ: 5-2.1 Use the properties of exponents and radicals to identify ways to rewrite radical expressions.
NAT: HSA.SSE.A.2 TOP: 5-2 Example 4 Add and Subtract Radical Expressions
KEY: like radicals

20. ANS: B PTS: 1 DIF: L2
REF: 5-2 Properties of Exponents and Radicals
OBJ: 5-2.1 Use the properties of exponents and radicals to identify ways to rewrite radical expressions.
NAT: HSA.SSE.A.2 TOP: 5-2 Example 5 Multiply Binomial Radical Expressions
KEY: like radicals

21. ANS: A PTS: 1 DIF: L3
REF: 5-2 Properties of Exponents and Radicals
OBJ: 5-2.1 Use the properties of exponents and radicals to identify ways to rewrite radical expressions.
NAT: HSA.SSE.A.2 TOP: 5-2 Example 5 Multiply Binomial Radical Expressions
KEY: like radicals

22. ANS: D PTS: 1 DIF: L4 REF: 5-3 Graphing Radical Functions
OBJ: 5-3.1 Graph radical functions, including square root and cube root functions.
NAT: HSF.IF.C.7| HSF.IF.C.7.b| HSF.IF.C.8
TOP: 5-3 Example 2 Graph a Transformation of a Radical Function
KEY: radical function

23. ANS: D PTS: 1 DIF: L2 REF: 5-4 Solving Radical Equations
OBJ: 5-4.1 Solve radical equations in one variable. NAT: HSA.CED.A.4| HSA.REI.A.2
TOP: 5-4 Example 1 Solve an Equation With One Radical KEY: square root equation

24. ANS: C PTS: 1 DIF: L3 REF: 5-4 Solving Radical Equations
OBJ: 5-4.1 Solve radical equations in one variable. NAT: HSA.CED.A.4| HSA.REI.A.2
TOP: 5-4 Example 4 Solve Equations With Rational Exponents
KEY: radical equation

25. ANS: C PTS: 1 DIF: L3 REF: 5-4 Solving Radical Equations
OBJ: 5-4.1 Solve radical equations in one variable. NAT: HSA.CED.A.4| HSA.REI.A.2
TOP: 5-4 Example 5 Solve an Equation With Two Radicals
KEY: radical equation | extraneous solution

26. ANS: B PTS: 1 DIF: L3 REF: 5-5 Function Operations
OBJ: 5-5.1 Combine functions by addition, subtraction, multiplication, or division, and identify the domain of the result. NAT: HSF.BF.A.1| HSF.BF.A.1.b
TOP: 5-5 Example 1 Add and Subtract Functions

27. ANS: C PTS: 1 DIF: L3 REF: 5-5 Function Operations
OBJ: 5-5.1 Combine functions by addition, subtraction, multiplication, or division, and identify the domain of the result. NAT: HSF.BF.A.1| HSF.BF.A.1.b TOP: 5-5 Example 2 Multiply Functions

28. ANS: D PTS: 1 DIF: L3 REF: 5-5 Function Operations
OBJ: 5-5.1 Combine functions by addition, subtraction, multiplication, or division, and identify the domain of the result. NAT: HSF.BF.A.1| HSF.BF.A.1.b TOP: 5-5 Example 3 Divide Functions

29. ANS: B PTS: 1 DIF: L3 REF: 5-5 Function Operations
OBJ: 5-5.2 Compose functions, specifying the order in which the functions are applied and describing the domain of the composite function. NAT: HSF.BF.A.1| HSF.BF.A.1.b
TOP: 5-5 Example 4 Compose Functions KEY: composite function

30. ANS: D PTS: 1 DIF: L2 REF: 5-6 Inverse Relations and Functions
OBJ: 5-6.1 Use tables, graphs, and equations to represent the inverse of a relation.
NAT: HSF.BF.B.4.a| HSF.BF.B.4.c TOP: 5-6 Example 1 Represent the Inverse of a Relation
KEY: inverse relation

31. ANS: B PTS: 1 DIF: L3 REF: 5-6 Inverse Relations and Functions
OBJ: 5-6.1 Use tables, graphs, and equations to represent the inverse of a relation.
NAT: HSF.BF.B.4.a| HSF.BF.B.4.c TOP: 5-6 Example 2 Find an Equation of an Inverse Relation
KEY: inverse relation

32. ANS: A PTS: 1 DIF: L3 REF: 5-6 Inverse Relations and Functions
OBJ: 5-6.1 Use tables, graphs, and equations to represent the inverse of a relation.
NAT: HSF.BF.B.4.a| HSF.BF.B.4.c TOP: 5-6 Example 2 Find an Equation of an Inverse Relation
KEY: inverse relation

33. ANS: D PTS: 1 DIF: L2 REF: 5-6 Inverse Relations and Functions
OBJ: 5-6.2 Write an equation for the inverse of a function by restricting the domain.
NAT: HSF.BF.B.4.a| HSF.BF.B.4.c TOP: 5-6 Example 4 Find an Equation of an Inverse Function
KEY: inverse function