Roots, Radicals, and Function Operations

Using Rational Exponents and nth Roots

Review Queue Answers

1. $25x^2$
2. $\frac{x^4}{3y^2}$
3. $9xy^2\sqrt{y}$
4. $\frac{5\sqrt{2}}{8}$

Defining nth Roots

1. $3\sqrt{3}$
2. $2\sqrt[5]{4}$
3. $\frac{625}{64}$
4. 32
5. $\frac{4}{27}$
6. $\frac{3\sqrt[4]{3}}{2}$
7. $2x\sqrt[3]{3x^2}$
8. $2xy^3\sqrt[4]{3x^3y}$
9. $2xy\sqrt[5]{\frac{5x^3}{y^2}}$
10. $100x^4$
11. $\frac{3x}{z^2}\sqrt[4]{\frac{2x}{y^3z^2}}$
12. $8x^4y^6\sqrt{10x}$

Rational Exponents and Roots

1. $45^{1/5} \approx 2.14$
2. $140^{1/9} \approx 1.73$
3. $50^{3/8} \approx 4.34$
4. $\sqrt[3]{72}^5 \approx 1246.10$
5. $\sqrt[3]{95^2} \approx 20.82$
6. $\sqrt[4]{125}^3 \approx 37.38$
7. 16
8. 81
9. 32
10. 125
11. 243
12. 4
13. $\frac{4}{9}$
14. $\frac{1}{4}$
15. 8

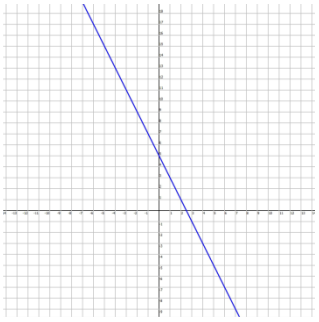
Applying the Laws of Exponents to Rational Exponents

1. $25a^{7/5}$
2. $49b^{2/3}$
3. $m^{2/9}$
4. $x^{1/2}y^{1/6}$
5. $\frac{2r^{4/5}}{s^{5/4}t^{4/9}}$
6. $a^5b^{8/3}$
7. $5^{3/2}x^{15/14}y^6$
8. $\frac{32x}{243y^2}$
9. $\frac{3125d^{5/4}}{3^{5/2}}$
10. $\frac{3}{2a^{1/2}}$
11. $18m^{2/15}n^{-1/10}$
12. $\frac{9x^{1/4}y^{7/5}}{25}$

Graphing Square Root and Cubed Root Functions

Review Queue Answers

1. ans-0701-01



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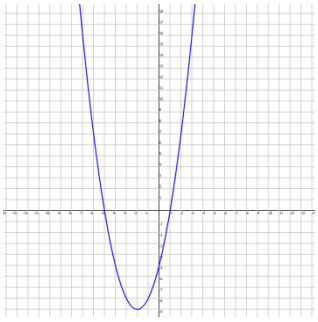

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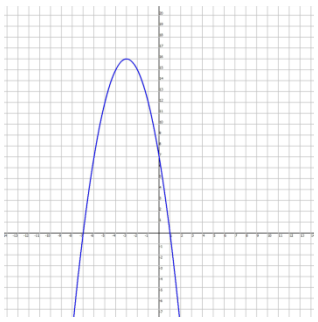
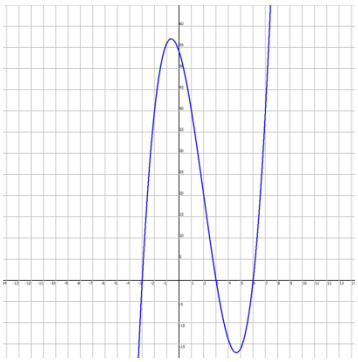


4. ans-0701-04

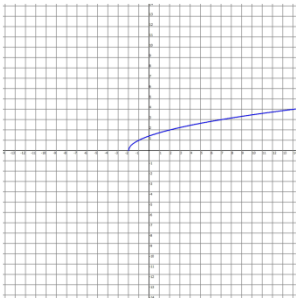


min: (4.65, -17.04), max: (-0.65, 57.04)

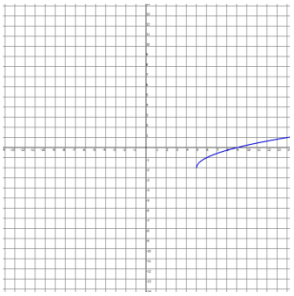
solutions: -3, 3, 6

Graphing Square Root Functions

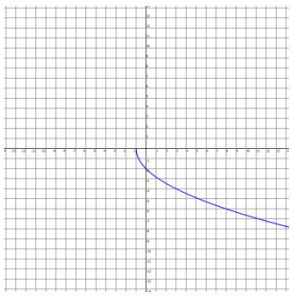
1. ans-0702-01



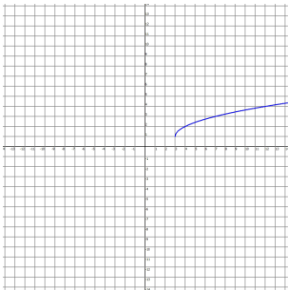
2. ans-0702-02



3. ans-0702-03



4. ans-0702-04



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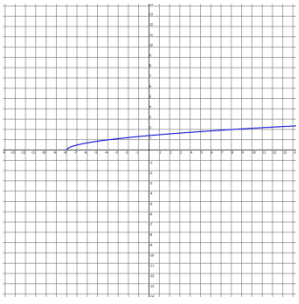

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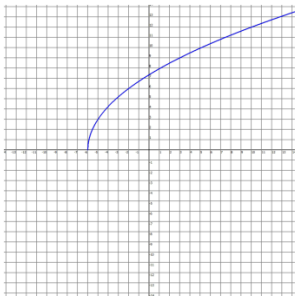

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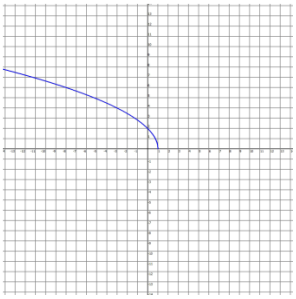
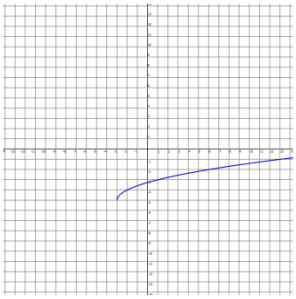


8. ans-0702-08



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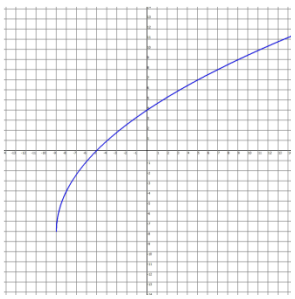
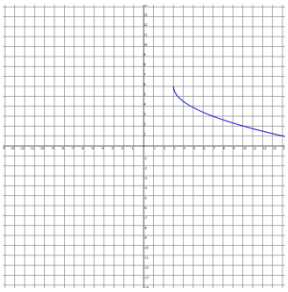
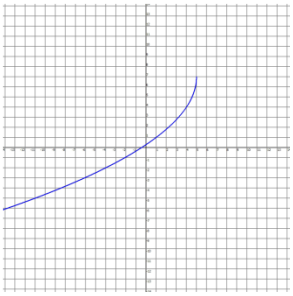


10. ans-0702-10



11. ans-0702-11



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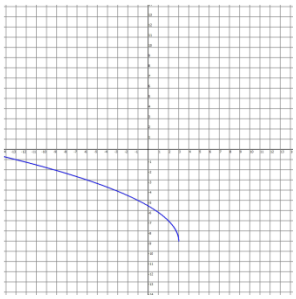
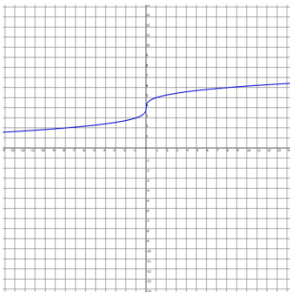
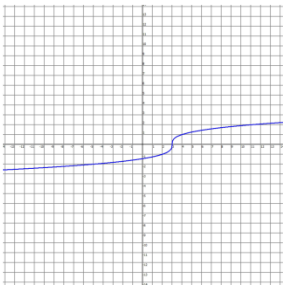


Graphing Cubed Root Functions

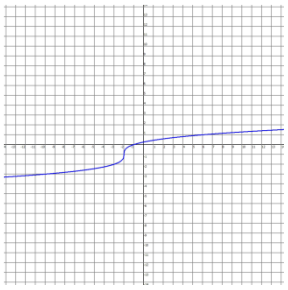
1. ans-0702-13



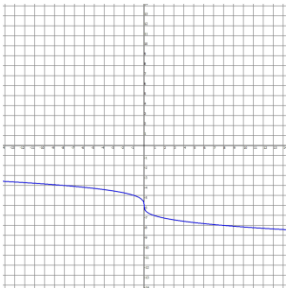
2. ans-0702-14



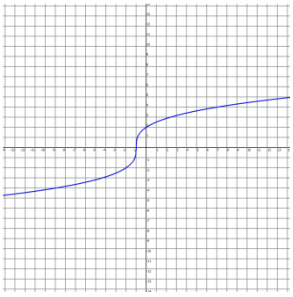
3. ans-0702-15



4. ans-0702-16



5. ans-0702-17



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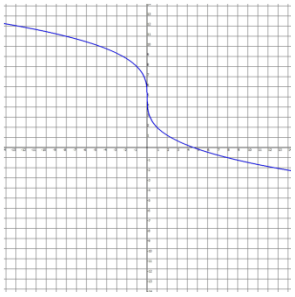

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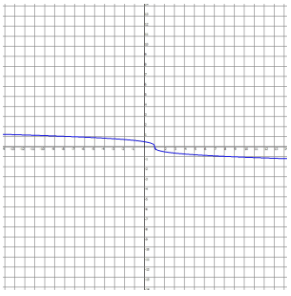

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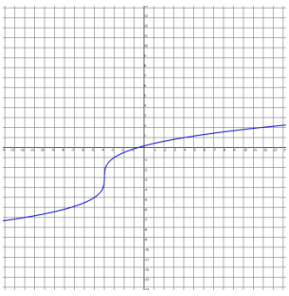

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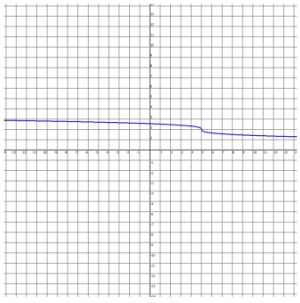

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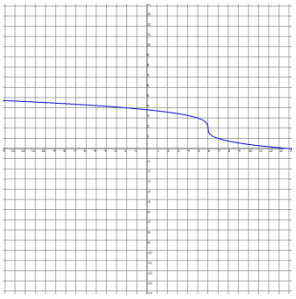

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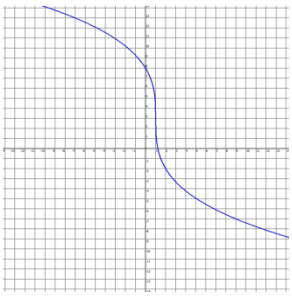
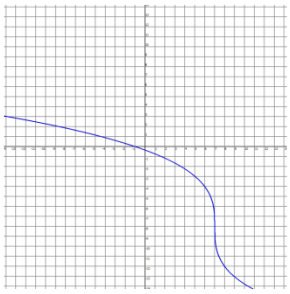


12. ans-0702-24



Extracting the Equation from a Graph

1. $y=\sqrt{x+7}$
2. $y=\sqrt[3]{x-3}$
3. $y=-2\sqrt{x}+5$
4. $y=2\sqrt[3]{x+2}$
5. $y=3\sqrt{x+8}-6$
6. $y=-\sqrt[3]{x+2}+1$
7. $y=-2\sqrt[3]{x-1}+4$
8. $y=-\sqrt{x+5}+7$
9. $y=\frac{1}{2}\sqrt{8-x}+3$
10. $y=5\sqrt{x+1}+6$
11. $y=-3\sqrt{x+6}-3$
12. $y=2\sqrt[3]{x-2}+7$

Solving Radical Equations

Review Queue Answers

1. x = 2, 7
2. $x=-\frac{4}{3},5$
3. x = 16

Solving Simple Radical Equations

1.	x = 3	2.	x = 3	3.	x = -4	4.	x = 7
5.	x = 10	6.	x = 61	7.	x = 6	8.	x = 37
9.	x = 87	10.	x = 120	11.	x = 72	12.	x = 390

Solving Radical Equations with Radicals on Both Sides

1.	x = 7	2.	x = 33	3.	x = 3
4.	x = 6, 10	5.	x = 2, -5	6.	x = 2, 3
7.	x = 7	8.	x = 5, 6	9.	x = -2, 2, -1
10.	x = 5	11.	x = -7, 7	12.	x = 5
13.	no solution	14.	x = 120.41, -31.16		

Solving Rational Exponent Equations

1.	x = 9	2.	x = 64	3.	x = 5	4.	x = 11
5.	x = 0, 4	6.	x = 5	7.	x = 27	8.	x = 32
9.	x = 128	10.	x = 100	11.	x = 2401	12.	x = 3, 1

Function Operations and the Inverse of a Function

Review Queue Answers

1. $x^2-3x+13$ 2. $-x^2+5x-3$ 3. x^2-5x+3 4. $x^3+x^2-12x+40$

Function Operations

1. x^2+5x+6
2. $5x+1-3\sqrt{x-5},\ x\geq 5$
3. $\frac{x^2+5}{3\sqrt{x-5}},\ x>5$
4. $5x^3+x^2+25x+5$
5. $9x-40,\ x\geq 5$
6. $5x^2+26$
7. $3x$
8. $45x-31,\ x\geq 4/5$
9. $x,\ x\neq 0$
10. $25,\ x>0$
11. $\frac{26}{5}\sqrt{x},\ x\geq 0$
12. $\frac{1}{\sqrt{x}},\ x>0$
13. $5x,\ x\geq 0$
14. $x\sqrt{5}$
15. $\frac{25}{x},\ x\neq 0$
16. $\frac{25}{\sqrt{x}},\ x>0$

Inverse Functions

1. (3, 2), (8, -4), (9, -5), (1, 1); yes
2. (-6, 9), (-5, 8), (3, 7), (3, 4)
3. $f^{-1}(x)=\frac{x+9}{6}$
4. $f^{-1}(x)=\frac{1-3x}{4x}, x\neq 0$
5. $f^{-1}(x)=x^2-7, x\geq 0$
6. $f^{-1}(x)=\sqrt{x-5}, x\geq 5$
7. $f^{-1}(x)=\sqrt[3]{x+11}$
8. $f^{-1}(x)=x^5-16$
9. yes
10. no
11. no
12. yes
13. $f^{-1}(x)=\frac{7}{x-1}, x\neq 1$
14. $f^{-1}(x)=\frac{8x}{x-1}, x\neq 1$
15. a. $m=\frac{212-32}{100-0}=\frac{180}{100}=\frac{9}{5}$

$32=\frac{9}{5}(0)+b$

$b=32$

$F=\frac{9}{5}C+32$

b. $F=\frac{9}{5}C+32$

$F-32=\frac{9}{5}C$

$\frac{5}{9}(F-32)=C$

c. $F=\frac{9}{5}\left[\frac{5}{9}(F-32)\right]+32$

$F=F-32+32$

$F=F$

or

$C=\frac{5}{9}\left(\frac{9}{5}C+32-32\right)$

$C=C$