



## Chapter 5 Review - GREEN STAR

Name \_\_\_\_\_

**Find the indicated real  $n$ th root(s) of  $a$ .**

1.  $n = 3, a = 125$

2.  $n = 6, a = 64$

3. Rewrite as a radical  $25^{3/2}$

**Find the real solution(s) of the equation. Round your answer to two decimal places.**

4.  $x^4 + 11 = 65$

5.  $(x + 7)^3 = 343$

6. Circle all of the following that are equivalent to  $\frac{x^3}{y^2}$ .

A. $\left(\frac{x^{18}}{y^{12}}\right)^{-1/6}$	B. $\left(\frac{y^{12}}{x^{18}}\right)^{-1/6}$	C. $\left(\frac{x^{-5}y^7}{x^{-2}y^5}\right)^{-1}$	D. $\left(\frac{x}{y^{2/3}}\right)^3$
E. $\left(y^{-1/2} \cdot x^{1/3}\right)^{-1}$	F. $(xy \cdot x^2y)^{-1}$	G. $\left(\frac{1}{x^3y^2}\right)^{-1}$	H. $\frac{x^{24}y^{14}}{y^{16}x^8}$

**Simplify. Write the expression in simplest form.**

7.  $\frac{1}{4-\sqrt{5}}$

8.  $\sqrt[4]{192a^6b^4c^{11}}$

9.  $\sqrt[4]{25} \cdot \sqrt[4]{3125}$

10.  $34\sqrt[3]{5x} - 7\sqrt[3]{5x}$

11.  $\sqrt[5]{486} + 10\sqrt[5]{2}$

12.  $\sqrt[3]{\frac{16}{49}}$

**Describe the transformation of  $f$  represented by  $g$ .**

13.  $f(x) = \sqrt{x}$      $g(x) = \sqrt{x-3} + 6$

14.  $f(x) = \sqrt[3]{x}$      $g(x) = -\frac{1}{2}\sqrt[3]{x}$

15. Let  $g$  be a horizontal stretch by a factor of 5, followed by a translation 3 units up of the graph of  $f(x) = \sqrt{2x}$ . Write a rule for  $g$  described by the transformation of the graph of  $f$ .

16. Let  $g$  be a reflection in the  $x$ -axis, followed by a translation 4 units right of the graph of  $f(x) = 2\sqrt{x} - 3$ . Write a rule for  $g$  described by the transformation of the graph of  $f$ .

17. Use a graphing calculator to graph the equation  $-2y^2 + 5 = x$ . Identify the vertex and the direction the parabola opens.

18. Use a graphing calculator to graph the equation  $x^2 + y^2 = 144$ . Identify the radius and the intercepts.

19.  $\sqrt[3]{x+5} = 2\sqrt[3]{2x+6}$

20.  $\sqrt{44-2x} = x-10$

21.  $\sqrt{x+6} + 1 = \sqrt{7-x}$

22.  $x^{1/4} + 3 = 0$

23.  $2(x+11)^{1/2} = x+3$

24.  $-2\sqrt[3]{x+4} < 12$

25.  $4\sqrt{x-2} > 20$

26.  $4\sqrt{x} + 3 \leq 23$

27. Let  $a(x) = 2x^3 + 4x^2 - 5x + 2$  and  $b(x) = -x^2 + 5x - 8$ . Perform each of the indicated operations. Evaluate when  $x = 5$ .

a.  $(a+b)(x)$

b.  $(a-b)(x)$

28. Let  $a(x) = x^2$  and  $b(x) = \sqrt[3]{x}$ . Perform each of the indicated operations. Evaluate when  $x = 5$ .

a.  $(ab)(x)$

b.  $\left(\frac{a}{b}\right)(x)$

**Find the inverse of the function. Graph the inverse and determine whether the inverse of the function is a function. Explain your answer.**

29.  $f(x) = 4x - 1$

30.  $f(x) = 9x^2$

31. Use composition of functions to determine whether  $f(x) = \frac{5-x}{2}$  and  $g(x) = 5 - 2x$  are inverses.



## Chapter 5 Review - BLUE STAR

Name \_\_\_\_\_

**Find the indicated real  $n$ th root(s) of  $a$ .**

1.  $n = 5, a = 1024$

2.  $n = 4, a = -625$

3. Rewrite as a radical  $49^{2/3}$

**Find the real solution(s) of the equation. Round your answer to two decimal places.**

4.  $x^6 - 84 = 645$

5.  $(x - 12)^3 = 216$

6. Circle all of the following that are equivalent to  $\frac{a^2}{b^3}$ .

A. $\left(\frac{a^{12}}{b^{18}}\right)^{1/6}$	B. $\left(\frac{a^{18}}{b^{12}}\right)^{-1/6}$	C. $\left(\frac{a^{-5}b^7}{a^{-3}b^4}\right)^{-1}$	D. $\left(\frac{a}{b^{2/3}}\right)^3$
E. $\left(a^{-1/3} \cdot b^{1/2}\right)^{-1}$	F. $(ab \cdot a^2b)^{-1}$	G. $\left(\frac{1}{b^3a^2}\right)^{-1}$	H. $\frac{a^{24}b^{11}}{b^{14}a^{22}}$

**Simplify. Write the expression in simplest form.**

7.  $\frac{1}{3-\sqrt{2}}$

8.  $\sqrt[3]{96a^6b^4c^{11}}$

9.  $\sqrt[4]{125} \cdot \sqrt[4]{25}$

10.  $33\sqrt[4]{3x} - 16\sqrt[4]{3x}$

11.  $\sqrt[4]{162} + 10\sqrt[4]{2}$

12.  $\sqrt[3]{\frac{4}{49}}$

**Describe the transformation of  $f$  represented by  $g$ .**

13.  $f(x) = \sqrt{x}$      $g(x) = \sqrt{x-6} + 3$

14.  $f(x) = \sqrt[3]{x}$      $g(x) = \frac{1}{4}\sqrt[3]{-x}$

15. Let  $g$  be a vertical stretch by a factor of 5, followed by a translation 4 units up of the graph of  $f(x) = \sqrt{6x}$ . Write a rule for  $g$  described by the transformation of the graph of  $f$ .

16. Let  $g$  be a reflection in the  $y$ -axis, followed by a translation 5 units left of the graph of  $f(x) = 3\sqrt{x} - 2$ . Write a rule for  $g$  described by the transformation of the graph of  $f$ .

17. Use a graphing calculator to graph the equation  $-3y^2 + 2 = x$ . Identify the vertex and the direction the parabola opens.

18. Use a graphing calculator to graph the equation  $x^2 + y^2 = 121$ . Identify the radius and the intercepts.

19.  $\sqrt[3]{4x-1} = \sqrt[3]{6x+5}$

20.  $\sqrt{10x+24} = x+12$

21.  $\sqrt{x-7} = 7 - \sqrt{x}$

22.  $3x^{2/3} - 30 = 18$

23.  $(6x+8)^{1/2} = 3x$

24.  $-3\sqrt[3]{x-4} > -15$

25.  $2\sqrt{x-3} \leq 14$

26.  $3\sqrt{x} - 4 \geq 5$

27. Let  $a(x) = 5x^3 - 3x^2 + x - 12$  and  $b(x) = -x^3 - 2x + 8$ . Perform each of the indicated operations. Evaluate when  $x = 4$ .

a.  $(a+b)(x)$

b.  $(a-b)(x)$

28. Let  $a(x) = x^3$  and  $b(x) = \sqrt[4]{x}$ . Perform each of the indicated operations. Evaluate when  $x = 3$ .

a.  $(ab)(x)$

b.  $\left(\frac{a}{b}\right)(x)$

**Find the inverse of the function. Graph the inverse and determine whether the inverse of the function is a function. Explain your answer.**

29.  $f(x) = 5x - 3$

30.  $f(x) = (x-3)^2$

31. Use composition of functions to determine whether  $f(x) = \frac{9+x}{-2}$  and  $g(x) = -9 - 2x$  are inverses.



## Chapter 5 Review - YELLOW STAR

Name \_\_\_\_\_

**Find the indicated real  $n$ th root(s) of  $a$ .**

1.  $n = 5, a = 16,807$
2.  $n = 4, a = 4096$
3. Rewrite as a radical  $121^{7/3}$

**Find the real solution(s) of the equation. Round your answer to two decimal places.**

4.  $3x^2 - 75 = 300$
5.  $(x - 6)^3 = 40$

6. Circle all of the following that are equivalent to  $\frac{1}{x^3y^2}$ .

A. $\left(\frac{x^{18}}{y^{12}}\right)^{-1/6}$	B. $\left(\frac{y^{12}}{x^{18}}\right)^{-1/6}$	C. $\left(\frac{x^{-5}y^7}{x^{-2}y^5}\right)^{-1}$	D. $\left(\frac{x^{-1}}{y^{2/3}}\right)^3$
E. $\left(y^{-1/2} \cdot x^{1/3}\right)^{-1}$	F. $(xy \cdot x^2y)^{-1}$	G. $\left(\frac{1}{x^{-3}y^{-2}}\right)^{-1}$	H. $\frac{x^4y^4}{y^{12}x^8}$

**Simplify. Write the expression in simplest form.**

7.  $\frac{1}{7+\sqrt{3}}$
8.  $\sqrt[4]{162a^7b^{13}c^4}$
9.  $\sqrt[3]{50} \cdot \sqrt[3]{625}$

10.  $74\sqrt[7]{2x} - 36\sqrt[7]{2x}$
11.  $\sqrt[6]{192} + 13\sqrt[6]{3}$
12.  $\sqrt[4]{\frac{8}{9}}$

**Describe the transformation of  $f$  represented by  $g$ .**

13.  $f(x) = \sqrt{x}$      $g(x) = \sqrt{x-7} - 9$
14.  $f(x) = \sqrt[3]{x}$      $g(x) = \frac{1}{4}\sqrt[3]{-x}$

15. Let  $g$  be a horizontal stretch by a factor of 3, followed by a translation 5 units up of the graph of  $f(x) = \sqrt{x+1}$ . Write a rule for  $g$  described by the transformation of the graph of  $f$ .
16. Let  $g$  be a reflection in the  $y$ -axis, followed by a translation 6 units left of the graph of  $f(x) = 2\sqrt{x} - 1$ . Write a rule for  $g$  described by the transformation of the graph of  $f$ .

17. Use a graphing calculator to graph the equation  $-4y^2 - 3 = x$ . Identify the vertex and the direction the parabola opens.

18. Use a graphing calculator to graph the equation  $-y^2 = x^2 - 256$ . Identify the radius and the intercepts.

19.  $\sqrt[3]{\frac{1}{2}(x+10)} = \sqrt[3]{16x+48}$

20.  $\sqrt{2x-14} = x-7$

21.  $\sqrt{x+7} + 2 = \sqrt{3-x}$

22.  $x^{5/2} - 3 = 29$

23.  $(5-x)^{1/2} = 2x$

24.  $\sqrt[3]{\frac{2}{3}x+1} < 6$

25.  $5\sqrt{x-1} > 10$

26.  $-4\sqrt{x-1} + 3 \geq -1$

27. Let  $a(x) = 5x^3 - 2x^2 - 4$  and  $b(x) = -x^3 + 2x^2 + 5x - 1$ . Perform each of the indicated operations. Evaluate when  $x = -1$ .

a.  $(a+b)(x)$

b.  $(a-b)(x)$

28. Let  $a(x) = x^2$  and  $b(x) = \sqrt[5]{x}$ . Perform each of the indicated operations. Evaluate when  $x = 6$ .

a.  $(ab)(x)$

b.  $\left(\frac{a}{b}\right)(x)$

**Find the inverse of the function. Graph the inverse and determine whether the inverse of the function is a function. Explain your answer.**

29.  $f(x) = 12x - 7$

30.  $f(x) = (x-8)^2$

31. Use composition of functions to determine whether  $f(x) = \frac{4-x}{15}$  and  $g(x) = 4 - 15x$  are inverses.