

1. Fill in the blank.

For any (1) \_\_\_\_\_ number  $a$ ,  $\sqrt{a^2} = a$ .

- (1) ☐ negative  
☐ positive

2. Fill in the blank.

If  $\sqrt[4]{x}$  is a real number, then  $x$  must be (1) \_\_\_\_\_

- (1) ☐ nonnegative.  
☐ negative.  
☐ positive.

3. Find all the square roots of 16.

The square roots of 16 are \_\_\_\_\_.  
(Use a comma to separate answers as needed.)

4. Simplify the following expression.

$$\sqrt{361}$$

$$\sqrt{361} = \underline{\hspace{2cm}}$$

5. Find the square root.

$$-\sqrt{81}$$

$$-\sqrt{81} = \underline{\hspace{2cm}}$$

6. Simplify the radical.

$$\sqrt{\frac{49}{16}}$$

$$\sqrt{\frac{49}{16}} = \underline{\hspace{2cm}} \text{ (Type an integer or a simplified fraction.)}$$

7. Simplify the following expression.

$$-\sqrt{\frac{49}{36}}$$

$$-\sqrt{\frac{49}{36}} = \underline{\hspace{2cm}} \text{ (Type an integer or a simplified fraction.)}$$

8. Find the principal square root of 0.16.

$$\sqrt{0.16} = \underline{\hspace{2cm}}$$

(Simplify your answer.)

9. Find the indicated values for the function  $f(x) = \sqrt{5x - 25}$ .

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A.  $f(8) =$  \_\_\_\_\_ (Round to the nearest hundredth as needed.)  
☐ B. The function value is not a real number.

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A.  $f(5) =$  \_\_\_\_\_ (Round to the nearest hundredth as needed.)  
☐ B. The function value is not a real number.

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A.  $f(4) =$  \_\_\_\_\_ (Round to the nearest hundredth as needed.)  
☐ B. The function value is not a real number.

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A.  $f(-4) =$  \_\_\_\_\_ (Round to the nearest hundredth as needed.)  
☐ B. The function value is not a real number.

10. Simplify. Use absolute value notation when necessary.

$$\sqrt{64x^2}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A.  $\sqrt{64x^2} =$  \_\_\_\_\_ (Simplify your answer.)  
☐ B. The square root is not a real number.

11. Simplify. Remember to use absolute-value notation when necessary. If a root cannot be simplified, state this.

$$\sqrt{(-8c)^2}$$

Choose the correct answer below and, if necessary, fill in the answer box to complete your choice.

- ☐ A.  $\sqrt{(-8c)^2} =$  \_\_\_\_\_ (Simplify your answer.)  
☐ B. The root is not a real number.

12. Simplify. Remember to use absolute-value notation when necessary. If a root cannot be simplified, state this.

$$\sqrt{x^2 - 18x + 81}$$

Choose the correct answer below and, if necessary, fill in the answer box to complete your choice.

- ☐ A.  $\sqrt{x^2 - 18x + 81} =$  \_\_\_\_\_ (Simplify your answer.)  
☐ B. The root is not a real number.

13. Simplify. Remember to use absolute-value notation when necessary. If a root cannot be simplified, state this.

$$\sqrt{a^{14}}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A.  $\sqrt{a^{14}} =$  \_\_\_\_\_ (Simplify your answer.)
- ☐ B. The square root is not a real number.

14. Find the square root that is a real number.

$$\sqrt{-16}$$

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- ☐ A.  $\sqrt{-16} =$  \_\_\_\_\_
- ☐ B. The square root is not a real number.

15. Simplify the following.

$$\sqrt[3]{-125}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A.  $\sqrt[3]{-125} =$  \_\_\_\_\_  
(Type an integer or a decimal.)
- ☐ B. The root is not a real number.

16. Simplify the following.

$$-\sqrt[3]{27}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A.  $-\sqrt[3]{27} =$  \_\_\_\_\_  
(Type an integer or a decimal.)
- ☐ B. The root is not a real number.

17. Simplify the following.

$$-\sqrt[3]{-125y^3}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A.  $-\sqrt[3]{-125y^3} =$  \_\_\_\_\_  
(Use integers or decimals for any numbers in the expression.)
- ☐ B. The root is not a real number.

18. Identify the radicand and the index.

$$8\sqrt{p^4 + 1}$$

What is the radicand? \_\_\_\_\_

What is the index of the expression? \_\_\_\_\_

19. Identify the radicand and the index.

$$x^7 y^3 \sqrt[4]{\frac{x}{y}}$$

What is the radicand? \_\_\_\_\_

What is the index of the expression? \_\_\_\_\_

20. Simplify the following expression. Use absolute-value notation when necessary.

$$\sqrt[20]{y^{20}}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A.  $\sqrt[20]{y^{20}} =$  \_\_\_\_\_ (Simplify your answer.)
- ☐ B. The root is not a real number.

21. Simplify. Use absolute value notation when necessary.

$$\sqrt[15]{x^{15}}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A.  $\sqrt[15]{x^{15}} =$  \_\_\_\_\_
- ☐ B. The root is not a real number.

22. Simplify. Assume that the radicand was not formed by raising negative quantities to even powers.

$$\sqrt{16x^2}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A.  $\sqrt{16x^2} =$  \_\_\_\_\_ (Simplify your answer.)
- ☐ B. The square root is not a real number.

23. Simplify. Assume that the radicand was not formed by raising negative quantities to even powers.

$$\sqrt[4]{1296c^4}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A.  $\sqrt[4]{1296c^4} = \underline{\hspace{2cm}}$  (Simplify your answer.)
- ☐ B. The root is not a real number.

24. Simplify the following expression. Assume that no radicands were formed by raising negative quantities to even powers. Thus, absolute-value notation is not necessary.

$$\sqrt{x^{14}}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A.  $\sqrt{x^{14}} = \underline{\hspace{2cm}}$  (Simplify your answer.)
- ☐ B. The root is not a real number.

25. For the given function, find the following function values.

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

Find  $f(-127)$ . Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A.  $f(-127) = \underline{\hspace{2cm}}$  (Simplify your answer.)
- ☐ B. The root is not a real number.

Find  $f(25)$ . Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A.  $f(25) = \underline{\hspace{2cm}}$  (Simplify your answer.)
- ☐ B. The root is not a real number.

Find  $f(62)$ . Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A.  $f(62) = \underline{\hspace{2cm}}$  (Simplify your answer.)
- ☐ B. The root is not a real number.

Find  $f(-29)$ . Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A.  $f(-29) = \underline{\hspace{2cm}}$  (Simplify your answer.)
- ☐ B. The root is not a real number.

26. For the given function, find the following function values.

$$g(t) = \sqrt[4]{t-2}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A.  $g(83) =$  \_\_\_\_\_ (Simplify your answer.)
- ☐ B. The root is not a real number.

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A.  $g(-6) =$  \_\_\_\_\_ (Simplify your answer.)
- ☐ B. The root is not a real number.

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A.  $g(4098) =$  \_\_\_\_\_ (Simplify your answer.)
- ☐ B. The root is not a real number.

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A.  $g(3) =$  \_\_\_\_\_ (Simplify your answer.)
- ☐ B. The root is not a real number.

27. Determine the domain of the function.

$$f(x) = \sqrt{x-10}$$

The domain of  $f(x)$  is \_\_\_\_\_.  
(Type your answer in interval notation.)

28. Determine the domain of the function.

$$g(x) = \sqrt[6]{6-x}$$

What is the domain? \_\_\_\_\_.  
(Type in interval notation.)

29. Given the function  $h(x) = 4x + 3$ , find each of the following function values.

**a)**  $h(0)$    **b)**  $h(-9)$    **c)**  $h(5)$    **d)**  $h(a+3)$    **e)**  $h(a)+3$

- a)**  $h(0) =$  \_\_\_\_\_ (Simplify your answer.)
- b)**  $h(-9) =$  \_\_\_\_\_ (Simplify your answer.)
- c)**  $h(5) =$  \_\_\_\_\_ (Simplify your answer.)
- d)**  $h(a+3) =$  \_\_\_\_\_ (Simplify your answer. Do not factor.)
- e)**  $h(a)+3 =$  \_\_\_\_\_ (Simplify your answer. Do not factor.)

30. Find the domain of the function.

$$f(x) = 8x - 9$$

What is the domain of  $f$ ? Select the correct choice below and fill in any answer boxes within your choice.

- ☐ A.  $\{x|x \text{ is a real number and } x \neq \underline{\hspace{2cm}}\}$   
(Simplify your answer. Use a comma to separate answers as needed.)
- ☐ B.  $\{x|x \text{ is a real number}\}$

31. Find the domain of the function.

$$f(x) = \frac{11}{x + 9}$$

What is the domain of  $f$ ?

- ☐ A.  $\{x|x \text{ is a real number and } x \neq 0\}$
- ☐ B.  $\{x|x \text{ is a real number}\}$
- ☐ C.  $\{x|x \text{ is a real number and } x \neq -9\}$
- ☐ D.  $\{x|x \text{ is a real number and } x \neq -9 \text{ and } x \neq 0\}$

32. Fill in the blank.

The expression  $\sqrt{3x}$  is an example of a(n) (1) \_\_\_\_\_

- (1) ☐ equivalent expression.
- ☐ radical.
- ☐ rational expression.

33. Fill in the blank.

The expressions  $\sqrt[3]{10mn}$  and  $(10mn)^{\frac{1}{3}}$  are \_\_\_\_\_.

The expressions  $\sqrt[3]{10mn}$  and  $(10mn)^{\frac{1}{3}}$  are (1) \_\_\_\_\_.

- (1) ☐ equivalent
- ☐ not equivalent

34. Match the expression  $y^{\frac{3}{7}}$  with the equivalent expression from the choices given below.

$$(\sqrt{y^3})^7 \quad \sqrt[3]{y^7} \quad \sqrt[7]{y^3} \quad (\sqrt{y^7})^3$$

Choose the correct answer below.

- ☐  $\sqrt[3]{y^7}$   
☐  $(\sqrt{y^7})^3$   
☐  $\sqrt[7]{y^3}$   
☐  $(\sqrt{y^3})^7$

35. Match the expression  $x^{-\frac{19}{2}}$  with the equivalent expression from the choices given below.

$$\frac{1}{(\sqrt[19]{x})^2} \quad \frac{1}{(\sqrt{x})^{19}} \quad \sqrt{x^{19}} \quad (\sqrt{x})^{19}$$

Choose the correct answer below.

- ☐  $\frac{1}{(\sqrt[19]{x})^2}$   
☐  $\sqrt{x^{19}}$   
☐  $(\sqrt{x})^{19}$   
☐  $\frac{1}{(\sqrt{x})^{19}}$

36. Match the expression  $x^{\frac{7}{15}} \cdot x^{\frac{4}{15}}$  with the equivalent expression from the choices given below.

$$x^{\frac{11}{15}} \quad 2x^{\frac{28}{15}} \quad 2x^{\frac{11}{15}} \quad x^{\frac{28}{15}}$$

Choose the correct answer below.

- ☐  $x^{\frac{28}{15}}$   
☐  $2x^{\frac{28}{15}}$   
☐  $2x^{\frac{11}{15}}$   
☐  $x^{\frac{11}{15}}$



37. Match the expression  $\sqrt[4]{x^9}$  with the equivalent expression from the choices given below.

$$\left(\sqrt[4]{x}\right)^9 \quad \frac{1}{\left(\sqrt[9]{x}\right)^4} \quad \frac{1}{\left(\sqrt[4]{x}\right)^9} \quad \left(\sqrt[9]{x}\right)^4$$

Choose the correct answer below.

- ☐  $\left(\sqrt[9]{x}\right)^4$ 
☐  $\frac{1}{\left(\sqrt[4]{x}\right)^9}$
- ☐  $\frac{1}{\left(\sqrt[9]{x}\right)^4}$ 
☐  $\left(\sqrt[4]{x}\right)^9$

38. Rewrite without rational exponents, and simplify, if possible.

$$\frac{1}{5}$$

x

$$\frac{1}{5}$$

x = \_\_\_\_\_

(Simplify your answer. Type an exact answer, using radicals as needed.)

39. Use radical notation to rewrite the expression. Then simplify, if possible.

$$\frac{1}{4^{\frac{1}{2}}}$$

$$\frac{1}{4^{\frac{1}{2}}} =$$

(Simplify your answer.)

40. Evaluate.

$$625^{\frac{1}{4}}$$

$$625^{\frac{1}{4}} =$$

(Simplify your answer. Type an integer.)

41. Use radical notation to rewrite the expression. Then simplify, if possible.

$$16^{\frac{1}{2}}$$

$$16^{\frac{1}{2}} =$$

(Simplify your answer.)

42. Use radical notation to rewrite the expression. Simplify, if possible.

$$(xy)^{\frac{1}{10}}$$

Rewrite the expression using radical notation.

$$(xy)^{\frac{1}{10}} = \underline{\hspace{2cm}}$$

43. Rewrite without rational exponents, and simplify, if possible.

$$81^{\frac{3}{4}}$$

$$81^{\frac{3}{4}} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type an integer.)

44. Simplify.

$$\frac{5}{4^2}$$

The solution is                     .  
(Simplify your answer. Type an integer or a fraction.)

45. Write an equivalent expression for the following using radical notation and, if possible, simplify.

$$(81x)^{\frac{3}{4}}$$

$$(81x)^{\frac{3}{4}} = \underline{\hspace{2cm}} \text{ (Simplify your answer.)}$$

46. Rewrite without fractional exponents. Assume that all even roots are positive quantities.

$$(9x^4)^{\frac{5}{2}}$$

$$(9x^4)^{\frac{5}{2}} = \underline{\hspace{2cm}}$$

(Simplify your answer.)

47. Rewrite with rational exponents.

$$\sqrt{m^9}$$

$$\sqrt{m^9} = \underline{\hspace{2cm}}$$

(Simplify your answer.)

48. Rewrite with rational exponents. Assume that the radicand of an even root is a positive quantity.

$$\sqrt[7]{m^8}$$

$$\sqrt[7]{m^8} = \underline{\hspace{2cm}}$$

(Simplify your answer.)

49. Rewrite with rational exponents.

$$\left( \sqrt[11]{5x^8y} \right)^7$$

$$\left( \sqrt[11]{5x^8y} \right)^7 = \underline{\hspace{2cm}}$$

(Simplify your answer.)

50. Rewrite  $216^{-\frac{1}{3}}$  with a positive exponent, then simplify.

Simplify.

$$216^{-\frac{1}{3}} = \underline{\hspace{2cm}}$$

51. Write an equivalent expression with positive exponents and, if possible, simplify.

$$\left(\frac{1}{25}\right)^{-\frac{3}{2}}$$

$$\left(\frac{1}{25}\right)^{-\frac{3}{2}} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type exponential notation with positive exponents. Use integers or fractions for any numbers in the expression.)

52. Use the laws of exponents to simplify.

$$5^{\frac{3}{5}} \cdot 5^{\frac{3}{10}}$$

$$5^{\frac{3}{5}} \cdot 5^{\frac{3}{10}} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type exponential notation with positive exponents.)

53. Use the laws of exponents to simplify. Do not use negative exponents in your answer.

$$\frac{2^{\frac{3}{8}}}{2^{-\frac{3}{8}}}$$

$$\frac{2^{\frac{3}{8}}}{2^{-\frac{3}{8}}} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type exponential notation with positive exponents. Use integers or fractions for any numbers in the expression.)

54. Use the laws of exponents to simplify.

$$\left(3^{\frac{5}{6}}\right)^{\frac{2}{7}}$$

$$\left(3^{\frac{5}{6}}\right)^{\frac{2}{7}} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type exponential notation with rational exponents.)

55. Use the laws of exponents to simplify.

$$\left(63^{\frac{7}{11}}\right)^{\frac{11}{7}}$$

---

$$\left(63^{\frac{7}{11}}\right)^{\frac{11}{7}} = \underline{\hspace{2cm}}$$

---

56. Use rational exponents to simplify the expression. If rational exponents appear after simplifying, write the answer in radical notation. Assume that all variables represent positive numbers.

$$\sqrt[15]{x^5}$$

---

$$\sqrt[15]{x^5} = \underline{\hspace{2cm}}$$

---

57. Use rational exponents to simplify.

$$\sqrt[3]{x^6}$$

---

Complete the expression.

$$\sqrt[3]{x^6} = \underline{\hspace{2cm}}$$

(Simplify your answer.)

---

58. Use rational exponents to simplify the expression. If rational exponents appear after simplifying, write the answer in radical notation. Assume that all variables represent positive numbers.

$$\left(\sqrt[18]{3y}\right)^8$$

---

$$\left(\sqrt[18]{3y}\right)^8 = \underline{\hspace{2cm}}$$

---

59. Solve. Be sure to check.

$$3(t - 2) - t = 6$$

---

The solution is                     . (Type an integer or a simplified fraction.)

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60. Solve. Then graph.

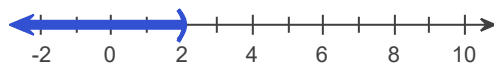
$$8 - 2x \geq 4$$

The solution is  $\{x \mid x \underline{\hspace{1cm}} \underline{\hspace{1cm}}\}$ .

(Simplify your answer. Type an inequality symbol, then type an integer or a decimal.)

Choose the correct graph of the inequality.

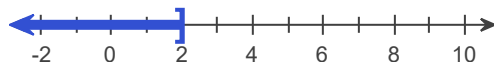
☐ A.



☐ B.



☐ C.



☐ D.



61. Solve and graph the solution set.

$$8 > \frac{x-2}{2} > 5$$

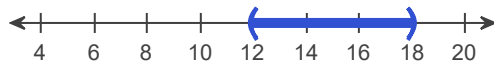
Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

☐ A. The solution set is                     . (Type your answer in interval notation.)

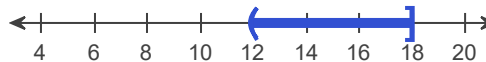
☐ B. The solution set is the empty set.

Choose the graph of the solution set.

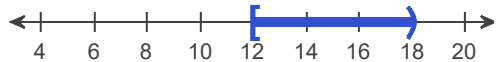
☐ A.



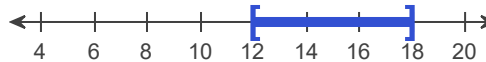
☐ B.



☐ C.



☐ D.



62. Solve.

$$w^2 + 6w = 27$$

$w = \underline{\hspace{2cm}}$

(Simplify your answer. Use a comma to separate answers as needed.)

63. Select the answer that best completes the given statement.

If  $\sqrt[n]{a}$  and  $\sqrt[n]{b}$  are real numbers, then  $\sqrt[n]{a} \cdot \sqrt[n]{b} = (1) \underline{\hspace{2cm}}$

(1) ☐  $a\sqrt[n]{b}$ .

☐  $\sqrt{ab}$ .

☐  $b\sqrt[n]{a}$ .

☐  $\sqrt[n]{ab}$ .

64. Classify the following statement as either true or false.

The expression  $\sqrt[3]{X}$  is not simplified if X contains a factor that is a perfect cube.

Choose the correct answer below.

- ☐ A. False, because the radicand is not a perfect cube.
- ☐ B. True, because the product rule  $\sqrt[n]{ab} = \sqrt[n]{a} \cdot \sqrt[n]{b}$  allows to simplify  $\sqrt[n]{ab}$  when a or b is a perfect nth power.
- ☐ C. True, because the product rule  $\sqrt[n]{ab} = \sqrt[n]{a} + \sqrt[n]{b}$  allows to simplify  $\sqrt[n]{ab}$  when a or b is a perfect nth power.
- ☐ D. False, because the radicand is not an integer multiple of 3.

65. Multiply.

$$\sqrt{5} \cdot \sqrt{2}$$

$$\sqrt{5} \cdot \sqrt{2} = \underline{\hspace{2cm}}$$

(Type an exact answer, using radicals as needed.)

66. Multiply.

$$\sqrt[4]{2} \cdot \sqrt[4]{3}$$

$$\sqrt[4]{2} \cdot \sqrt[4]{3} = \underline{\hspace{2cm}}$$

(Type an exact answer, using radicals as needed.)

67. Use the product rule to multiply.

$$\sqrt{x+2} \cdot \sqrt{x-2}$$

$$\sqrt{x+2} \cdot \sqrt{x-2} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type an exact answer, using radicals as needed.)

68. Simplify by factoring.

$$\sqrt{24}$$

$$\sqrt{24} = \underline{\hspace{2cm}}$$

(Type an exact answer, using radicals as needed.)

69. Simplify by factoring.

$$\sqrt{12}$$

$$\sqrt{12} = \underline{\hspace{2cm}}$$

(Type an exact answer, using radicals as needed.)

70. Simplify by factoring. Assume that all expressions under radicals represent nonnegative numbers.

$$\sqrt{80a^{11}}$$

The answer is  $\underline{\hspace{2cm}}$ .

(Type an exact answer, using radicals as needed.)

71. Simplify.

$$\sqrt{245}$$

$$\sqrt{245} = \underline{\hspace{2cm}}$$

(Type an exact answer, using radicals as needed.)

72. Simplify by factoring.

$$\sqrt{1575x^4y}$$

$$\sqrt{1575x^4y} = \underline{\hspace{2cm}}$$

(Simplify your answer.)

73. Simplify by factoring.

$$\sqrt[3]{216x^3y^2}$$

$$\sqrt[3]{216x^3y^2} = \underline{\hspace{2cm}} \text{ (Simplify your answer.)}$$

74. Simplify by factoring. Assume that all expressions under radicals represent nonnegative numbers.

$$\sqrt{x^{10}y^{23}}$$

$$\sqrt{x^{10}y^{23}} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type in radical form.)

75. Simplify. Assume that no radicands were formed by raising negative numbers to even powers.

$$\sqrt[7]{x^{30}y^{14}z^{22}}$$

$$\sqrt[7]{x^{30}y^{14}z^{22}} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type in radical form.)

76. Simplify by factoring. Assume that all expressions under the radical represent nonnegative numbers.

$$\sqrt[5]{256x^{12}y^{30}}$$

$$\sqrt[5]{256x^{12}y^{30}} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type in radical form.)

77. Multiply and simplify by factoring.

$$\sqrt{10} \cdot \sqrt{15}$$

$$\sqrt{10} \cdot \sqrt{15} = \underline{\hspace{2cm}}$$

(Type an exact answer, using radicals as needed.)

78. Multiply.

$$\sqrt[3]{3} \cdot \sqrt[3]{9}$$

$$\sqrt[3]{3} \cdot \sqrt[3]{9} = \underline{\hspace{2cm}}$$

79. Multiply and simplify. Assume that no radicands were formed by raising negative numbers to even powers.

$$\sqrt{6x^3} \sqrt{36x^6}$$

$$\sqrt{6x^3} \sqrt{36x^6} = \underline{\hspace{2cm}}$$

(Simplify your answer. Use integers or fractions for any numbers in the expression.)

80. Divide and simplify.

$$\frac{x^2 - 1}{x^2 - 6x + 9} \div \frac{5x - 5}{x^2 - 2x - 3}$$

The simplified quotient is \_\_\_\_\_.  
(Type your answer in factored form.)

81. Simplify by taking roots of the numerator and denominator.

$$\sqrt{\frac{16}{81}}$$

$$\sqrt{\frac{16}{81}} = \underline{\hspace{2cm}}$$

(Type an exact answer, using radicals as needed.)

82. Simplify by taking the roots of the numerator and the denominator.

$$\sqrt[3]{\frac{343}{125}}$$

$$\sqrt[3]{\frac{343}{125}} = \underline{\hspace{2cm}} \text{ (Simplify your answer. Type an exact answer, using radicals as needed.)}$$

83. Simplify by taking roots of the numerator and denominator. Assume all variables represent positive numbers.

$$\sqrt{\frac{4}{y^2}}$$

$$\sqrt{\frac{4}{y^2}} = \underline{\hspace{2cm}}$$

84. Simplify by taking roots of the numerator and denominator. Assume that all expressions under the radicals represent positive numbers.

$$\sqrt{\frac{64y^7}{x^8}}$$

$$\sqrt{\frac{64y^7}{x^8}} = \underline{\hspace{2cm}}$$

85. Divide. Then simplify by taking roots, if possible. Assume that all expressions under radicals represent positive numbers.

$$\frac{\sqrt{35a}}{\sqrt{5a}}$$

$$\frac{\sqrt{35a}}{\sqrt{5a}} = \underline{\hspace{2cm}}$$



86. Divide. Then simplify by taking roots, if possible. Assume that all expressions under radicals represent positive numbers.

$$\frac{\sqrt{21xy^3}}{\sqrt{3x}}$$

$$\frac{\sqrt{21xy^3}}{\sqrt{3x}} = \underline{\hspace{2cm}}$$

87. Divide. Then simplify by taking roots, if possible. Assume all expressions under radicals represent positive numbers.

$$\frac{\sqrt{2025xy}}{3\sqrt{3}}$$

$$\frac{\sqrt{2025xy}}{3\sqrt{3}} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type an exact answer, using radicals as needed.)

88. Rationalize the denominator.

$$\sqrt{\frac{11}{2}}$$

$$\sqrt{\frac{11}{2}} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type an exact answer, using radicals as needed.)

89. Rationalize the denominator.

$$\frac{15\sqrt{7}}{7\sqrt{3}}$$

$$\frac{15\sqrt{7}}{7\sqrt{3}} = \underline{\hspace{2cm}}$$

(Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression.)

90. Rationalize the denominator.

$$3\sqrt{\frac{54}{25}}$$

$$3\sqrt{\frac{54}{25}} = \underline{\hspace{2cm}}$$

91. Rationalize the denominator. Assume that all variables represent positive real numbers.

$$\sqrt[6]{\frac{3}{xy^5}}$$

Choose the correct answer below.

☐ A.  $\frac{\sqrt[6]{3xy}}{xy}$

☐ B.  $\frac{\sqrt[6]{3x^5y}}{xy^5}$

☐ C.  $\frac{\sqrt[6]{3x^5y}}{x^5y}$

☐ D.  $\frac{\sqrt[6]{3x^5y}}{xy}$

92. Rationalize the denominator. Assume that all expressions under radicals represent positive numbers.

$$\sqrt{\frac{5x}{18}}$$

$$\sqrt{\frac{5x}{18}} = \underline{\hspace{2cm}}$$

93. Simplify.

$$49 - (-2)^2 + 30 \div (-5)(2)$$

$$49 - (-2)^2 + 30 \div (-5)(2) = \underline{\hspace{2cm}}$$

(Simplify your answer. Type an integer or a decimal.)

94. Divide as indicated.

$$(x^2 - 10x + 28) \div (x - 4)$$

$$(x^2 - 10x + 28) \div (x - 4) = \underline{\hspace{2cm}}$$

95. Fill in the blank.

To add radical expressions, both (1) \_\_\_\_\_ must be the same.

- (1) ☐ the radicands and the indices  
☐ the numerators and the indices  
☐ the numerators and the denominators  
☐ the denominators and the indices

96. Fill in the blank.

To find a product by adding exponents, the (1) \_\_\_\_\_ must be the same.

- (1) ☐ denominators ☐ radicands  
☐ numerators  
☐ bases  
☐ indices

97. Fill in the blank.

To rationalize the (1) \_\_\_\_\_ of  $\frac{\sqrt{c} - \sqrt{a}}{5}$ , multiply by a form of 1, using the (2) \_\_\_\_\_ of  $\sqrt{c} - \sqrt{a}$ , which is  $\sqrt{c} + \sqrt{a}$ , to write 1.

- (1) ☐ radicand (2) ☐ numerator  
☐ denominator ☐ denominator  
☐ conjugate ☐ radicand  
☐ numerator ☐ conjugate

98. Add. Simplify by collecting like radical terms, if possible.

$$8\sqrt{2} + 7\sqrt{2}$$

$$8\sqrt{2} + 7\sqrt{2} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type an exact answer, using radicals as needed.)

99. Subtract. Simplify by collecting like radical terms, if possible.

$$9\sqrt[3]{2} - 5\sqrt[3]{2}$$

$$9\sqrt[3]{2} - 5\sqrt[3]{2} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type an exact answer, using radicals as needed.)

100. Add or subtract. Simplify by collecting like radical terms, if possible.

$$5\sqrt{2} - 2\sqrt{2} + 6\sqrt{2}$$

$$5\sqrt{2} - 2\sqrt{2} + 6\sqrt{2} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type an exact answer, using radicals as needed.)

101. Subtract. Simplify by collecting like radical terms if possible.

$$7\sqrt{12} - 5\sqrt{3}$$

$$7\sqrt{12} - 5\sqrt{3} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type an exact answer, using radicals as needed.)

102. Add. Simplify by collecting like radical terms if possible.

$$2\sqrt[3]{40} + \sqrt[3]{135}$$

$$2\sqrt[3]{40} + \sqrt[3]{135} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type an exact answer, using radicals as needed.)

103. Add. Simplify by collecting like radical terms if possible, assuming that all expressions under radicals represent nonnegative numbers.

$$\sqrt{18y - 18} + \sqrt{2y - 2}$$

$$\sqrt{18y - 18} + \sqrt{2y - 2} = \underline{\hspace{2cm}}$$

104. Add. Simplify by collecting like radical terms if possible, assuming that all expressions under radicals represent nonnegative numbers.

$$\sqrt{x^3 - x^2} + \sqrt{25x - 25}$$

$$\sqrt{x^3 - x^2} + \sqrt{25x - 25} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type an exact answer, using radicals as needed.)

105. Multiply as indicated. If possible, simplify any radical expressions that appear in the product.

$$\sqrt{5} (6 - \sqrt{5})$$

$$\sqrt{5} (6 - \sqrt{5}) = \underline{\hspace{2cm}}$$

106. Multiply as indicated. If possible, simplify any radical expressions that appear in the product.

$$(3 + \sqrt{5}) (6 - 4\sqrt{5})$$

$$(3 + \sqrt{5}) (6 - 4\sqrt{5}) = \underline{\hspace{2cm}}$$

(Simplify your answer. Type an exact answer, using radicals as needed.)

107. Multiply, then simplify the products.

$$(4 + \sqrt{7})(4 - \sqrt{7})$$

$$(4 + \sqrt{7})(4 - \sqrt{7}) = \underline{\hspace{2cm}}$$

(Simplify your answer.)

108. Rationalize the denominator.

$$\frac{2}{8 - \sqrt{7}}$$

$$\frac{2}{8 - \sqrt{7}} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type an exact answer, using radicals as needed.)

109. Rationalize the denominator.

$$\frac{3 + \sqrt{7}}{3 - \sqrt{5}}$$

$$\frac{3 + \sqrt{7}}{3 - \sqrt{5}} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type an exact answer, using radicals as needed.)

110. Rationalize the denominator and simplify.

$$\frac{\sqrt{7} - \sqrt{5}}{\sqrt{5} - \sqrt{7}}$$

$$\frac{\sqrt{7} - \sqrt{5}}{\sqrt{5} - \sqrt{7}} = \underline{\hspace{2cm}}$$

111. Perform the indicated operation and simplify. Assume that all variables represent positive real numbers.

$$\sqrt[30]{y} \sqrt[15]{y}$$

$$\sqrt[30]{y} \sqrt[15]{y} = \underline{\hspace{2cm}} \text{ (Type an exact answer, using radicals as needed.)}$$

112. Use rational exponents to write a single, simplified radical expression, assuming that all expressions under radicals represent nonnegative numbers.

$$\sqrt[12]{x^{11}y^{13}} \sqrt{xy}$$

$$\sqrt[12]{x^{11}y^{13}} \sqrt{xy} = \underline{\hspace{2cm}}$$

(Type an exact answer, using radicals as needed.)

113. Use rational exponents to write as a single radical expression.

$$\frac{\sqrt[4]{x^2y^3}}{\sqrt[3]{xy}}$$

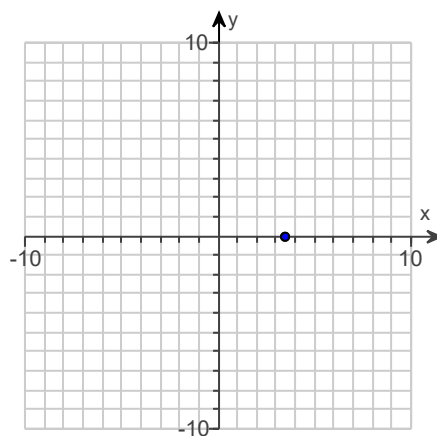
$$\frac{\sqrt[4]{x^2y^3}}{\sqrt[3]{xy}} = \underline{\hspace{2cm}}$$

114. In which quadrant or on which axis is the given point

$$\left(\frac{7}{2}, 0\right)$$
 located?

Select the correct choice below and fill in the answer box to complete your choice.

- ☐ A. The point is located in quadrant \_\_\_\_\_.
- ☐ B. The point is located on the \_\_\_\_\_-axis.



115. Using the slope formula, find the slope of the line through the given points.

$$(5, 4) \text{ and } (7, 6)$$

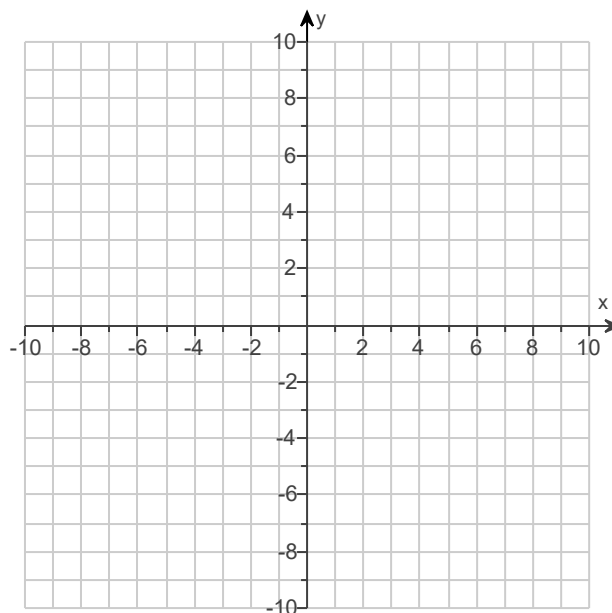
What is the slope of the line? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The slope of the line is \_\_\_\_\_. (Type an integer or a simplified fraction.)
- ☐ B. The slope of the line is undefined.

116. Plot the intercepts to graph the equation.

$$x + y = 5$$

Use the graphing tool to graph the equation. Use the intercepts when drawing the line. If only one intercept exists, use it and another point to draw the line.



117. Determine the slope and the y-intercept of the following equation.

$$4x + 5y = 8$$

The slope is \_\_\_\_\_.  
(Type an integer or a simplified fraction.)

The y-intercept is \_\_\_\_\_.  
(Type an ordered pair, using integers or fractions.)

118. Write an equation of the line containing the specified point and perpendicular to the indicated line.

$(-2, 6)$ ,  $x + y = 3$

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The answer is \_\_\_\_\_.

(Type an equation. Type your answer in slope-intercept form. Use integers or fractions for any numbers in the equation. Simplify your answer.)

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119. Find an equation of the line containing the pair of points. Write your answer in slope-intercept form.

$(3, 4)$  and  $(9, 7)$

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\_\_\_\_\_.  
(Type an equation. Type your answer in slope-intercept form. Use integers or fractions for any numbers in the equation. Simplify your answer.)