1. Find the root.

$\sqrt[3]{1}$

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

○A. $\sqrt[3]{1} =$ ☐

○B. The root is not a real number.

2. Find the root.

$\sqrt[3]{-27}$

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

○A. $\sqrt[3]{-27} =$ ☐

○B. The root is not a real number.

3. Simplify.

$-\sqrt[4]{81}$

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

○A. $-\sqrt[4]{81} =$ ☐

(Simplify your answer.)

○B. The root is not a real number.

4. Find the root.

$\sqrt{\frac{25}{49}}$

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

○A. $\sqrt{\frac{25}{49}} =$ ☐

○B. The root is not a real number.

HW 4

5. Find the root.

$$\sqrt[3]{\frac{125}{3,375}}$$

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

○A. $\sqrt[3]{\frac{125}{3,375}} = \square$

○B. The root is not a real number.

6. Find the root.

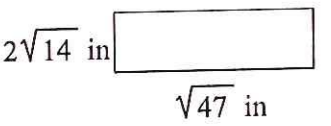
$$\sqrt[6]{\frac{1}{15625}}$$

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

○A. $\sqrt[6]{\frac{1}{15625}} = \square$

○B. The root is not a real number.

7. Choose the best estimate for the area (in square inches) of the rectangle.



What is the best estimate?

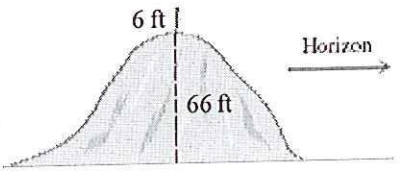
○A. 56 square inches

○B. 28 square inches

○C. 80 square inches

○D. 72 square inches

8. The distance D, in miles, to the horizon from an observer's point of view over water or "flat" earth is given below, where H is the height of the point of view, in feet. If a person whose eyes are 6 ft above ground level is standing at the top of a hill 66 ft above "flat" earth, approximately how far to the horizon will she be able to see?



$D = \sqrt{2H}$

The distance to the horizon from the observer's point of view is approximately ☐ mi.
(Round to the nearest mile as needed.)

9. The formula $I = \sqrt{\frac{2P}{L}}$ relates the coefficient of self-induction L (in henrys), the energy P stored in an electronic circuit (in joules), and the current I (in amps). Find I if P = 110 and L = 100.

I = ☐ amps
(Round to the nearest thousandth.)

10. Simplify.

$64^{3/2}$

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

○A. $64^{3/2} =$ ☐ (Type an integer or a simplified fraction.)

○B. The solution is not a real number.

11. Evaluate the expression.

$216^{5/3}$

Which term represents the simplified form of $216^{5/3}$?

○A. $\left(\sqrt[3]{216}\right)^5$

○B. $\sqrt[3]{216^5}$

○C. $\sqrt[5]{216^3}$

○D. 7776

12. Evaluate the exponential.

$-49^{5/2}$

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

○A. $-49^{5/2} =$ ■ (Type an integer or a simplified fraction.)

○B. The solution is not a real number.

13. Simplify the expression. Write your answer with positive exponents. Assume that all variables represent positive real numbers.

$a^{7/15} \cdot a^{-1/3}$

$a^{7/15} \cdot a^{-1/3} =$ □

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

14. Simplify the expression.

$$\frac{p^{-1/5}}{p^{1/5} \cdot p^{-4/5}}$$

$$\frac{p^{-1/5}}{p^{1/5} \cdot p^{-4/5}} =$$ □

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

15. Simplify the expression. Write your answer with positive exponents. Assume that all variables represent positive real numbers.

$$\frac{(x^{1/4}s^{5/9})^{36}}{x^5}$$

$$\frac{(x^{1/4}s^{5/9})^{36}}{x^5} =$$ □

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

16. Meteorologists can determine the duration of a storm by using the function defined by $T(D) = 0.07\,D^{3/2}$, where D is the diameter of the storm in miles and T is the time in hours. Find the duration of a storm with a diameter of 9 miles.

The duration is □ hours.

(Round to the nearest tenth of an hour as needed.)

17. Use the formula, windchill temperature $= 35.74 + 0.6215T - 35.75V^{4/25} + 0.4275TV^{4/25}$, where T is the temperature in °F and V is the wind speed in miles per hour, and a calculator to determine the windchill when the temperature is 20°F with a 15 mph wind.

The windchill temperature is $\square$° when the temperature is 20°F with a 15 mph wind.
(Simplify your answer. Round to the nearest tenth of a degree as needed.)

18. Use the formula, windchill temperature $= 35.74 + 0.6215T - 35.75V^{4/25} + 0.4275TV^{4/25}$, where T is the temperature in °F and V is the wind speed in miles per hour, and a calculator to determine the windchill when the temperature is 40°F with a 15 mph wind.

The windchill temperature is $\square$° when the temperature is 40°F with a 15 mph wind.
(Simplify your answer. Round to the nearest tenth of a degree as needed.)

19. Multiply and then, if possible, simplify by factoring.

$\sqrt{50}\ \sqrt{50}$

$\sqrt{50}\ \sqrt{50} = \square$
(Simplify your answer. Type an exact answer, using radicals as needed.)

20. Simplify $\sqrt{112} \cdot \sqrt{175}$.

$\sqrt{112} \cdot \sqrt{175} = \square$
(Type an exact answer, using radicals as needed.)

21. Multiply.

$\sqrt{5} \cdot \sqrt{7}$

$\sqrt{5} \cdot \sqrt{7} = \square$
(Type an exact answer, using radicals as needed.)

22. Simplify the radical. Assume that all variables represent positive real numbers.

$\sqrt{\frac{r}{16}}$

$\sqrt{\frac{r}{16}} = \square$
(Type an exact answer, using radicals as needed.)

23. Simplify the radical. Assume that all variables represent positive real numbers.

$\sqrt{\frac{t^6}{64}}$

$\sqrt{\frac{t^6}{64}} = \square$

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

24. Simplify.

$\sqrt[3]{-\frac{125}{216}}$

$\sqrt[3]{-\frac{125}{216}} = \square$ (Simplify your answer. Type an exact answer, using radicals as needed.)

25. Simplify.

$-3\sqrt{5} + 9\sqrt{45}$

Select the correct choice below and fill in any answer boxes in your choice.

○A. $-3\sqrt{5} + 9\sqrt{45} = \blacksquare$
(Simplify your answer. Type an exact answer, using radicals as needed.)

○B. The expression cannot be simplified.

26. Simplify.

$3\sqrt[3]{24} + \sqrt[3]{375}$

Select the correct choice below and fill in any answer boxes in your choice.

○A. $3\sqrt[3]{24} + \sqrt[3]{375} = \blacksquare$
(Simplify your answer. Type an exact answer, using radicals as needed.)

○B. The expression cannot be simplified.

27. Simplify.

$\sqrt[3]{128}+2\sqrt[3]{2}$

Select the correct choice below and fill in any answer boxes in your choice.

○A. $\sqrt[3]{128}+2\sqrt[3]{2}=$ ■

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

○B. The expression cannot be simplified.

28. Simplify.

$2\sqrt{108}+4\sqrt{75}-4\sqrt{27}$

Select the correct choice below and fill in any answer boxes in your choice.

○A. $2\sqrt{108}+4\sqrt{75}-4\sqrt{27}=$ ■

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

○B. The expression cannot be simplified.

29. Simplify. Assume that all variables represent positive real numbers.

$\sqrt{27x}-\sqrt{12x}$

Select the correct choice below and fill in any answer boxes in your choice.

○A. $\sqrt{27x}-\sqrt{12x}=$ ■

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

○B. The expression cannot be simplified.

30. Simplify. Assume that all variables represent positive real numbers.

$6\sqrt{75m^2}+\sqrt{48m^2}-\sqrt{12m^2}$

Select the correct choice below and fill in any answer boxes in your choice.

○A. $6\sqrt{75m^2}+\sqrt{48m^2}-\sqrt{12m^2}=$ ■

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

○B. The expression cannot be simplified.

31. Simplify. Assume all variables represent positive real numbers.

$$\sqrt{\frac{25}{x^{10}}} - \sqrt{\frac{4}{x^{8}}}$$

Select the correct choice below and fill in any answer boxes in your choice.

○A. $\sqrt{\frac{25}{x^{10}}} - \sqrt{\frac{4}{x^{8}}} = \square$
(Simplify your answer. Type an exact answer, using radicals as needed.)

○B. The expression cannot be simplified.

32. Simplify. Assume that all variables represent positive real numbers.

$$5\sqrt[4]{\frac{m^{11}}{256}} - 4m^2\sqrt[4]{\frac{m^3}{81}}$$

Select the correct choice below and fill in any answer boxes in your choice.

○A. $5\sqrt[4]{\frac{m^{11}}{256}} - 4m^2\sqrt[4]{\frac{m^3}{81}} = \square$
(Simplify your answer. Type an exact answer, using radicals as needed.)

○B. The expression cannot be simplified.

33. Simplify. Assume all variables represent positive real numbers.

$$4\sqrt[3]{\frac{7}{x^{9}}} - 5\sqrt[3]{\frac{6}{x^{12}}}$$

Select the correct choice below and fill in any answer boxes in your choice.

○A. $4\sqrt[3]{\frac{7}{x^{9}}} - 5\sqrt[3]{\frac{6}{x^{12}}} = \square$
(Simplify your answer. Type an exact answer, using radicals as needed.)

○B. The expression cannot be simplified.

34. A rectangular electronic scoreboard for a sports arena has a length of $\sqrt{101}$ meters and a width of $\sqrt{58}$ meters. Choose the best estimate of its dimensions.

Its dimensions are approximately ___.

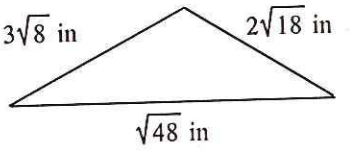
○A. 11 meters by 7 meters.

○B. 10 meters by 7 meters.

○C. 10 meters by 8 meters.

○D. 11 meters by 8 meters.

35. Find the perimeter of the triangle.



The perimeter is ☐ inches.
(Type an exact answer, using radicals as needed.)

36. What is the perimeter of a computer graphic with sides measuring $2\sqrt{50}$, $2\sqrt{72}$, $3\sqrt{98}$, and $4\sqrt{20}$ centimeters?

The perimeter is ☐ centimeters.
(Type an exact answer, using radicals as needed.)

37. Multiply, then simplify the product.

$(\sqrt{3}+2)(\sqrt{21}-5)$

$(\sqrt{3}+2)(\sqrt{21}-5)=$ ☐
(Simplify your answer. Type an exact answer, using radicals as needed.)

38. Multiply.

$(2\sqrt{5}+3\sqrt{7})(2\sqrt{5}-\sqrt{7})$

$(2\sqrt{5}+3\sqrt{7})(2\sqrt{5}-\sqrt{7})=$ ☐
(Simplify your answer. Type an exact answer, using radicals as needed.)

39. Simplify. Assume that no radicands were formed by raising negative quantities to even powers.

$(\sqrt{3}-\sqrt{5})^2$

$(\sqrt{3}-\sqrt{5})^2 = \square$

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

40. Rationalize the denominator in the following expression.

$$\frac{9}{5+\sqrt{3}}$$

$\frac{9}{5+\sqrt{3}} = \square$

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

41. Rationalize the denominator.

$$\frac{\sqrt{5}}{\sqrt{2}+1}$$

$\frac{\sqrt{5}}{\sqrt{2}+1} = \square$

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

42. Rationalize the denominator in the expression. Assume that all variables represent positive real numbers and no denominators are 0.

$$\frac{3}{5\sqrt{7}+3\sqrt{2}}$$

Choose the correct answer below.

○A. $\dfrac{3}{5\sqrt{7}+3\sqrt{2}}=\dfrac{(5\sqrt{7}-3\sqrt{2})}{157}$

○B. $\dfrac{3}{5\sqrt{7}+3\sqrt{2}}=\dfrac{3(5\sqrt{7}+3\sqrt{2})}{157}$

○C. $\dfrac{3}{5\sqrt{7}+3\sqrt{2}}=\dfrac{(5\sqrt{7}+3\sqrt{2})}{157}$

○D. $\dfrac{3}{5\sqrt{7}+3\sqrt{2}}=\dfrac{3(5\sqrt{7}-3\sqrt{2})}{157}$

43. Solve the following equation.

$$15-\sqrt{x-4}=0$$

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

○A. The solution set is {□}.
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

○B. The solution is the empty set.

44. Solve the following equation.

$$\sqrt{3y+2}=\sqrt{2y+4}$$

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

○A. The solution set is {□}.
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

○B. The solution is the empty set.

45. Solve.

$\sqrt{37x-13} = 6\sqrt{x}$

What is the solution set? Select the correct choice below and, if necessary, fill in the answer box within your choice.

○A. The solution set is {□}.
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

○B. The solution set is ∅.

46. Solve the following equation.

$\sqrt{x+2} + \sqrt{3x+10} = 2$

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

○A. The solution set is {□}.
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

○B. The solution is the empty set.

47. Solve.

$\sqrt{4y+29} - \sqrt{y-4} = 6$

What is the solution set? Select the correct choice below and, if necessary, fill in the answer box within your choice.

○A. The solution set is {□}.
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

○B. The solution set is ∅.

48. Solve.

$\sqrt{3x-6}+\sqrt{2x+6}+1=0$

Choose the correct solution set.

○A. $\{17\}$

○B. $\{5\}$

○C. $\{5,29\}$

○D. $\varnothing$

49. Write the number as a product of a real number and i.

$\sqrt{-121}$

$\sqrt{-121}=\square$

(Simplify your answer. Type your answer in the form $a+bi$. Type an exact answer, using radicals as needed.)

50. Write the number as a product of a real number and i.

$-\sqrt{-4}$

$-\sqrt{-4}=\square$

(Simplify your answer. Type your answer in the form $a+bi$. Type an exact answer, using radicals as needed.)

51. Write the number as a product of a real number and i. Simplify all radical expressions.

$\sqrt{-5}$

$\sqrt{-5}=\square$

(Simplify your answer. Type your answer in the form $a+bi$. Type an exact answer, using radicals as needed.)

52. Subtract.

$(-3+10i)-(-10-3i)$

$(-3+10i)-(-10-3i)=\square$

(Simplify your answer. Type your answer in the form $a+bi$.)

53. Subtract.

$(-1-8i)-(-7-8i)$

$(-1-8i)-(-7-8i)=\square$

(Simplify your answer. Type your answer in the form a + bi.)

54. Add or subtract as indicated.

$(-2+14i)+(-3-4i)+(15+2i)$

$(-2+14i)+(-3-4i)+(15+2i)=\square$

(Simplify your answer. Type your answer in the form a + bi.)

55. Write the quotient in the form a + b i.

$$\frac{5i}{8+8i}$$

$$\frac{5i}{8+8i}=\square$$

(Simplify your answer. Type your answer in the form a + b i. Use integers or fractions for any numbers in the expression.)

56. Divide.

$$\frac{24+4i}{24-4i}$$

$$\frac{24+4i}{24-4i}=\square$$

(Simplify your answer. Type your answer in the form a + bi. Type an integer or a fraction.)

57. Divide.

$$\frac{7+18i}{-9i}$$

$$\frac{7+18i}{-9i}=\square$$

(Simplify your answer. Type your answer in the form a + bi. Use integers or fractions for any numbers in the expression.)

58. Find the power of i.

i^{41}

$i^{41} =$ ☐ (Simplify your answer.)

59. Find the power of i.

i^{54}

$i^{54} =$ ☐ (Simplify your answer. Type your answer in the form a + bi.)

60. Find the power of i.

i^{87}

$i^{87} =$ ☐ (Simplify your answer.)