

TEST NAME: EE.2 Roots
TEST ID: 774396
GRADE: 08 - Eighth Grade
SUBJECT: Mathematics
TEST CATEGORY: School Assessment

Student: _____

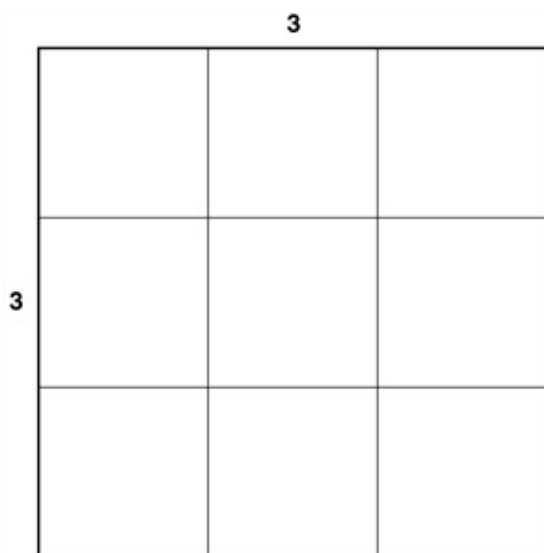
Class: _____

Date: _____

1. The volume of a cube is 1,728 cubic inches. The volume of a second cube is 729 cubic inches. What is the difference between the length of the sides of the two cubes?

- A. 3 inches
- B. 9 inches
- C. 12 inches
- D. 15 inches

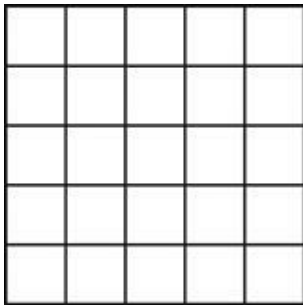
2. A manufacturer makes keys for a computer keyboard. One key is shown below.



Which expression best represents the area of the computer key?

- A. 3×2
- B. 3^2
- C. 2^3
- D. $3 \times \frac{1}{2}$

3. Which value represents the square root of the number of squares in the array below?



- A. 5
B. 9
C. 20
D. 25
4. Which expression equals 4?

A. $\sqrt{8}$

B. $\sqrt{12}$

C. $\sqrt{16}$

D. $\sqrt{20}$

5. What is the value of $\sqrt[3]{125}$?

A. 125

B. 25

C. 15

D. 5

6. Marsha cut out a square piece of fabric with an area of 32 square feet. Which expression could be used to find the side length of the fabric?

A. $32 - 4$

B. $32 \div 4$

C. $\sqrt{32} - 4$

D. $\sqrt{32}$

7. Which is an expression equivalent to $\sqrt{64}$?

- A. 32
- B. 2^3
- C. 4^2
- D. $4\sqrt{16}$

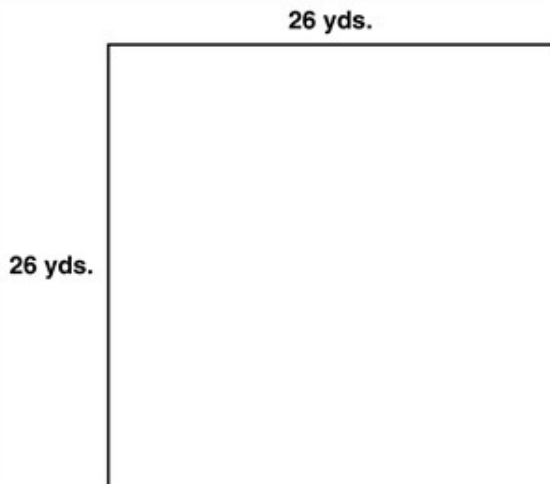
8. What is the value of $\sqrt[3]{0.343}$?

- A. 0.07
- B. 0.114
- C. 0.7
- D. 1.029

9. If $x^2 = 16$, what is the value of x ?

- A. 32
- B. 8
- C. 4

10. The diagram below shows the size of an animal pen on a farm.



Which expression best represents the area of the animal pen?

- A. 26×2
- B. 26×4
- C. 26^2
- D. 26^4

11. Mr. Waltz calculated the volume of two cubes.

- Cube J had a volume of 216 cm^3 .
- Cube K had a volume of 64 cm^3 .

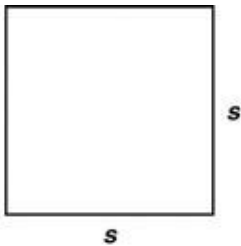
What is the difference in the measures of the side lengths of cube J and cube K?

- A. 2 cm
- B. 7 cm
- C. 76 cm
- D. 152 cm

12. What is the value of $\sqrt[3]{8}$?

- A. 2
- B. $2\frac{2}{3}$
- C. 5
- D. 24

13. The area of this square is 144 square inches.



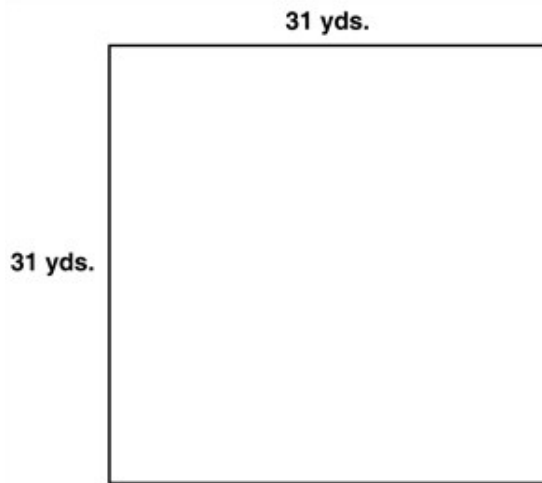
What is the length of each side, s , of the square?

- A. 12 inches
- B. 16 inches
- C. 36 inches
- D. 72 inches

14. What is the value of $\sqrt[3]{0.027}$?

- A. 0.09
- B. 0.03
- C. 0.3
- D. 0.9

15. The length of each side of this square is 31 yards.



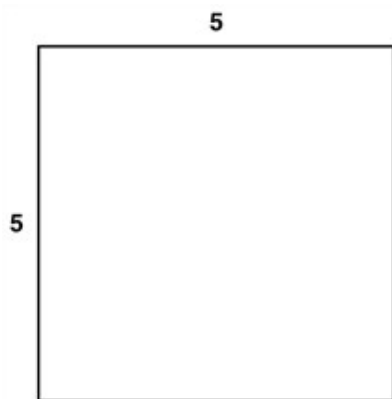
Which expression best represents the area of the square?

- A. 31×2
- B. 31×2^2
- C. $\sqrt{31}$
- D. 31^2
16. If $x^2 = 7$ what is a value of x ?
- A. $\sqrt{7}$
- B. 3.5
- C. $\sqrt{49}$
- D. 14
17. Tyler built a square cage for his chickens. The cage has an area of 169 ft^2 . What is the length of one side of the cage?
- A. 13 ft
- B. 42 ft
- C. 85 ft

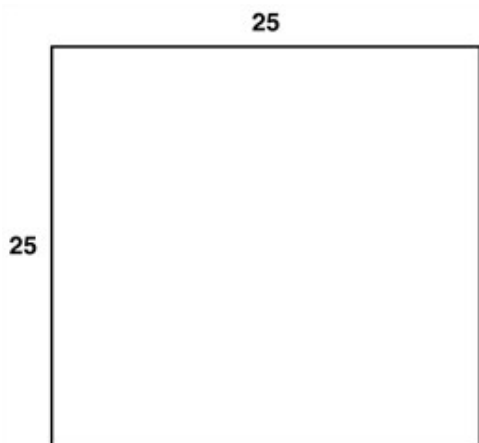
18. A cube has a volume of 216 cm^3 . What is the side length of the cube?
- A. 4 cm
 - B. 6 cm
 - C. 15 cm
 - D. 72 cm
19. Zachary has two square tables. The first table has an area of 1,296 square inches, which is 512 square inches more than the area of the second table. What is the length of the sides of Zachary's second table?
- A. 43 inches
 - B. 35 inches
 - C. 28 inches
 - D. 20 inches

20. Which model best represents $\sqrt{625}$?

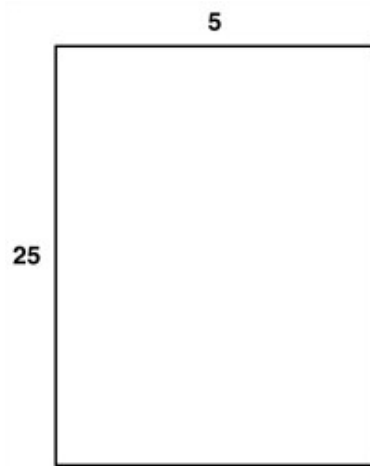
A.



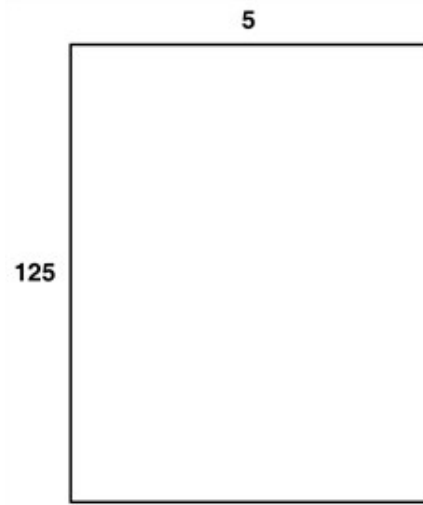
B.



C.



D.



21. The area of a square garden is 36 ft^2 . What is the perimeter of the garden?

- A. 6 ft
- B. 9 ft
- C. 18 ft
- D. 24 ft

22. Which is the value of x in the equation $x^3 = 64$?

- A. 4
- B. 8
- C. 16
- D. 21

23. Which expression shows the value of x in the equation $x^2 = 169$?

A. $\pm\sqrt{13}$

B. $\pm\frac{13}{2}$

C. $\pm\sqrt{169}$

D. $\pm\frac{169}{2}$

24. Tim bought 128 sandbags to completely fill a cube-shaped sandbox. Each bag fills a cubic foot in the sandbox. What is the length, in feet, of one of the sides of the sandbox?

A. $\sqrt{128}$

B. $\sqrt[3]{128}$

C. 128^2

D. 128^3

25. The numbers listed below are all perfect squares.

0.04, 2.56, $\frac{9}{4}$, 100

Which number has a square root that is larger than the given perfect square?

A. 0.04

B. 2.56

C. $\frac{9}{4}$

D. 100

26. The volume of a cube is 729 cubic units. What is the side length of the cube?

A. 2,187

B. 243

C. 27

D. 9

27. What is the value of $\sqrt{4^2}$?

- A. 2
- B. $2\sqrt{2}$
- C. 4
- D. 16

28. What is the value of the expression $\sqrt[3]{1000}$?

- A. 3000
- B. 100
- C. 30
- D. 10

29. What is the value of $\sqrt{144}$?

- A. 12
- B. 18
- C. 36
- D. 72

30. What is the value of $\sqrt{36}$?

- A. 1,296
- B. 72
- C. 18
- D. 6

31. If $a = 3b^2$ and $a = 27$, what is one value of b ?

- A. 1.73
- B. 3
- C. 4.5
- D. 9

32. The carpet used in Parker's bedroom covers an area of 121 square feet. If the carpet is square, what is the length of each side of the carpet?

- A. 9 feet
- B. 11 feet
- C. 12 feet
- D. 13 feet

33. What is the value of x in the equation $x^3 = \frac{1}{64}$?

- A. $\frac{1}{21}$
- B. $\frac{1}{8}$
- C. $\frac{1}{4}$

34. What is the value of x when $36 = x^2$?

- A. 6
- B. 18
- C. 34
- D. 72

35. What is the value of $\sqrt{\frac{9}{16}}$?

- A. $\frac{9}{4}$
- B. $\frac{3}{4}$
- C. $\frac{3}{8}$
- D. $\frac{3}{16}$

36. Carrie made a square tablecloth with an area of 169 square inches. What was the length of each side of the tablecloth?

- A. 9 inches
- B. 13 inches
- C. 17 inches
- D. 23 inches

37. What is the value of z when $z^3 = \frac{64}{27}$?

A. $\frac{\sqrt[3]{64}}{27}$

B. $\sqrt[3]{\frac{64}{27}}$

C. $\frac{64}{27(3)}$

D. $\frac{64^3}{27^3}$

38. What is the value of x in the equation $x^3 = 27$?

- A. 3
- B. 6
- C. 9

39. Willie wants to paint a wall in his bedroom. He measures the length and the width of the wall and finds that it is a square and that the area of the wall is 81 square feet. What is the length of Willie's wall?

- A. 4.5 feet
- B. 8.1 feet
- C. 9.0 feet
- D. 10.0 feet

40. What is the value of the $\sqrt{400}$?

- A. 7.4
- B. 20
- C. 40
- D. 200

41. What is the value of $\sqrt[3]{3\frac{3}{8}}$?

- A. $1\frac{1}{8}$
- B. $1\frac{3}{8}$
- C. $1\frac{1}{2}$
- D. $3\frac{1}{2}$

42. The formula $d = 1.2\sqrt{h}$ can be used to estimate how far you can see in miles when you are h feet above the ground. John is painting a water tower that is 81 feet tall. According to the formula, approximately how many miles can John see from the top of the water tower?

- A. 5.1
- B. 10.8
- C. 50.9
- D. 108

43. What is the value of $\sqrt[3]{0.512}$?

- A. 1.536
- B. 0.8
- C. 0.17
- D. 0.08

44. What is the value of $\sqrt{0.04}$?

- A. 0.2
- B. 0.08
- C. 0.02
- D. 0.0016

45. Given $144 = 12^2$, which statement is true?

- A. $144^2 = 12$
- B. $\sqrt{144} = 12$
- C. $\sqrt{12^2} = 144$
- D. $\sqrt{144^2} = 12$

46. Which value is equivalent to $\sqrt{9^2}$?

- A. 4.5
- B. $\sqrt{18}$
- C. 9
- D. 81

47. The area of a square classroom is 144 ft^2 . How long is one side of the classroom?

- A. 288 ft
- B. 72 ft
- C. 36 ft
- D. 12 ft

48. Which expression could represent the value of x in the equation below?

$$x^3 = 2$$

- A. $\frac{2}{3}$
- B. 2^3
- C. $\sqrt[3]{2}$
- D. $2 \cdot 3$

49. Which expression represents the value of x in the equation below?

$$x^2 = 25$$

- A. $\sqrt{5}$
- B. $\sqrt{25}$
- C. 5^2
- D. 25^2

50. A cube has a volume of 125 cubic inches. What is the length of one of its edges?

- A. 5 inches
- B. 10 inches
- C. 25 inches
- D. 60 inches

51. The area of a circle is 25π square inches. What is the length of the radius of the circle?

- A. 2.5 in.
- B. 5 in.
- C. 10 in.
- D. 12.5 in.

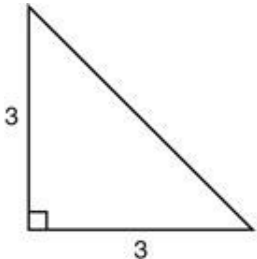
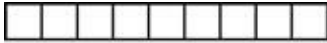
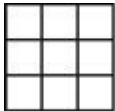
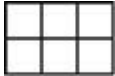
52. What is the value of $\sqrt{25} + \sqrt{16}$?

- A. $\sqrt{41}$
- B. 8
- C. 9
- D. 41

53. The diagonal length of a rectangular swimming pool can be represented by 10 times the square root of 5. Which represents this length?

- A. $10\sqrt{5}$
- B. $10(5)^2$
- C. $\sqrt{10 \times 5^2}$
- D. $(10 \times 5)^2$

54. Which model best represents the process for determining the value of 3^2 ?

- A. 
- B. 
- C. 
- D. 

55. What is the cube root of $\frac{1}{343}$?

- A. -7
- B. $-\frac{1}{7}$
- C. $\frac{1}{7}$
- D. 7

56. What is the value of x in the equation $x^2 = \frac{4}{9}$?

A. $\frac{16}{9}$

B. $\frac{2}{3}$

C. $\frac{2}{9}$

D. $\frac{16}{81}$

57. What is the value of n in the equation $n^2 = \frac{4}{25}$?

A. $\frac{2}{5}$

B. $\frac{2}{12}$

C. $\frac{2}{25}$

58. A square garden has an area of 36 ft^2 . What is the length of one side of the garden?

A. 18 ft

B. 12 ft

C. 6 ft

59. Which expression is equivalent to the solution to $x^2 = \frac{1}{81}$?

A. $\sqrt{3^{-2}}$

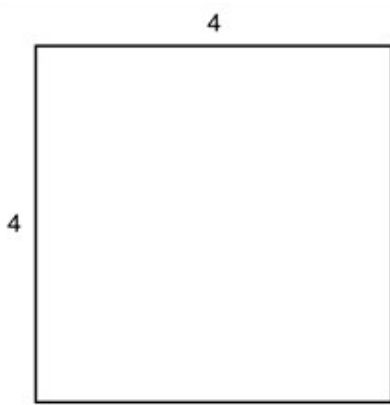
B. $\sqrt{3^2}$

C. $\sqrt{9^{-2}}$

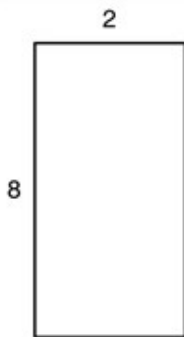
D. $\sqrt{9^2}$

60. Which model best represents $\sqrt{16}$?

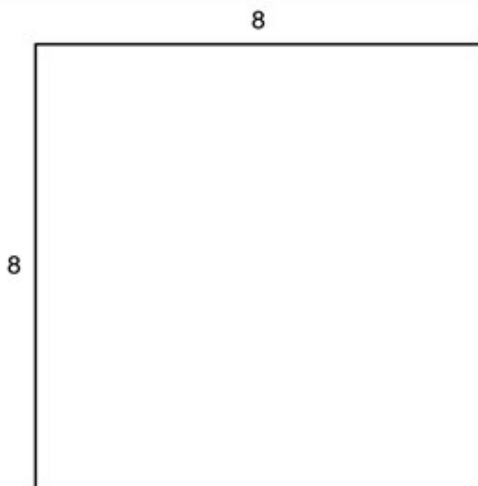
A.



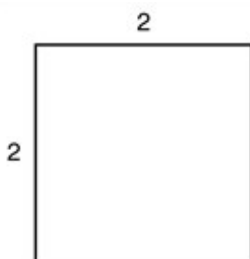
B.



C.



D.



61. What is the value of the expression $\sqrt[3]{216}$?
- A. 72
 - B. 27
 - C. 8
 - D. 6
62. In the equation $x^3 = 8$, what is the value of x ?
- A. 2
 - B. $\frac{8}{3}$
 - C. 5
 - D. 24
63. What is the square root of 0.04?
- A. 0.0016
 - B. 0.02
 - C. 0.16
 - D. 0.2
64. What is the value of $\sqrt{0.16}$?
- A. 0.08
 - B. 0.04
 - C. 0.4
 - D. 0.8
65. What is the value of $\sqrt{0.04}$?
- A. 2
 - B. 0.2
 - C. 0.02

66. Which value is equivalent to $\sqrt{3^2}$?

- A. 9
- B. 3
- C. $\sqrt{6}$
- D. 1.5

67. Which number is the square root of 64?

- A. 4
- B. 8
- C. 12
- D. 16

68. Which statement about the square root of a whole number, x , is true?

- A. The square root is less than or equal to x .
- B. The square root is never a whole number.
- C. The square root is always a whole number.
- D. The square root is greater than or equal to x .

69. What is the value of $\sqrt{16}$?

- A. 4
- B. 8
- C. 16
- D. 32

70. Which statement about the square root of a positive number is always true?

- A. The square root is a prime number.
- B. The square root is a positive number.
- C. The square root is a negative number.
- D. The square root is a factor of the number.

71. A square-shaped placemat has an area of 169 in.^2 . What is the length of one side of the placemat?

- A. 13 in.
- B. 16 in.
- C. 84.5 in.
- D. 338 in.

72. What is the value of $\sqrt{16}$?

- A. $\sqrt{4}$
- B. $\sqrt{8}$
- C. 4
- D. 8

73. Which represents the cube root of 512?

- A. 512^2
- B. 512^3
- C. $\sqrt[3]{512}$
- D. $\sqrt{512}$

74. In Mr. DeLeon's math class, players in any math game must represent their scores with a math expression. Arthur's game score is represented by this expression.

$$\frac{\sqrt{144}}{3}$$

What is Arthur's score?

- A. 4
- B. 12
- C. 24
- D. 48

75. What is the value of $\sqrt{0.81}$?

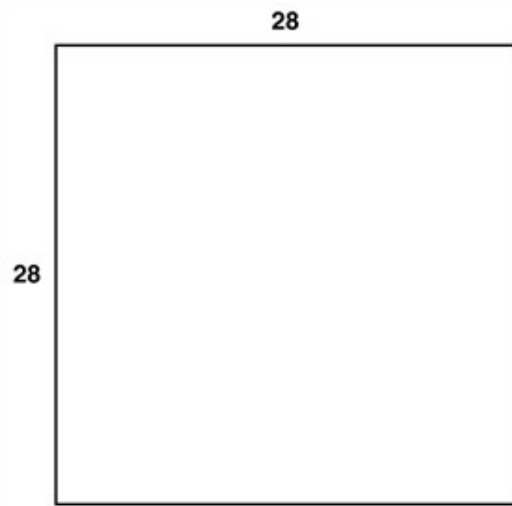
- A. 0.27
- B. 0.405
- C. 0.9
- D. 1.62

76. Which is the value of x in the equation $x^2 = 400$?

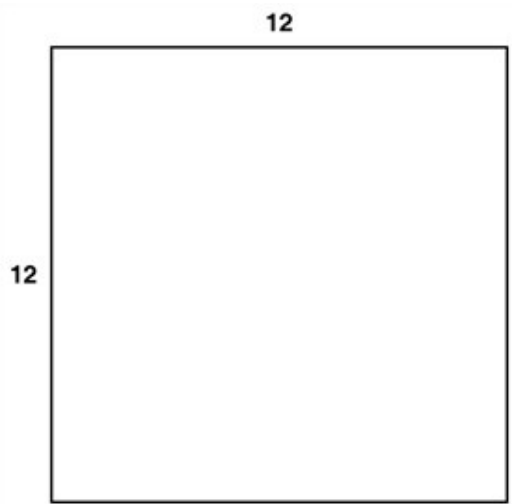
- A. 20
- B. 100
- C. 200
- D. 800

77. Which diagram below best models the number 14^2 ?

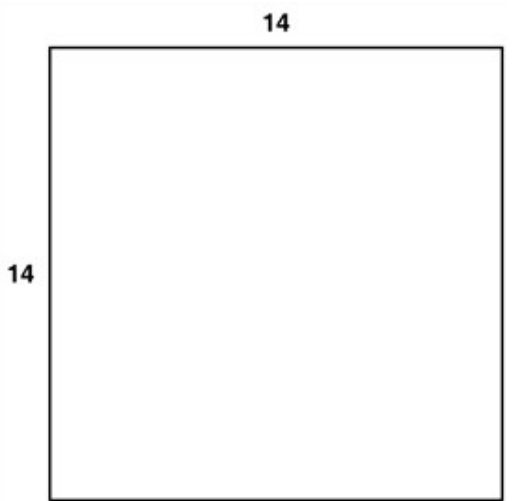
A.



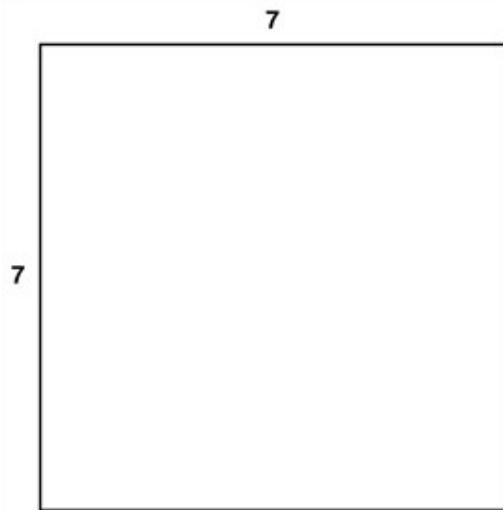
B.



C.



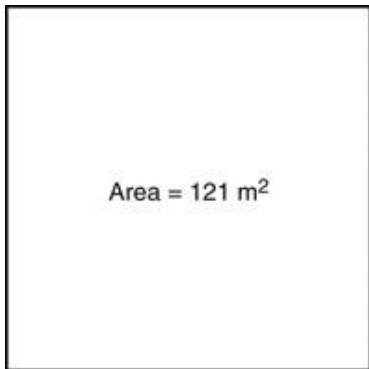
D.



78. A cube has a volume of 8 ft^3 . What is the length of one side of the cube?

- A. 4 ft
- B. 2 ft
- C. 1 ft

79. The figure below models a square with an area of 121 square meters.



Which expression best represents the length, in meters, of each side of the square?

- A. $\sqrt{121^2}$
- B. $\frac{121}{4}$
- C. 4×121
- D. $\sqrt{121}$

80. Given $\sqrt{49} = 7$, which of the following statements is true?

- A. $\sqrt{7} = 49$
- B. $49^2 = 7$
- C. 7 is the length of the side of a square whose area is 49.
- D. 7 is the length of the side of a square whose perimeter is 49.

81. Which value is equivalent to $\sqrt{7^2}$?

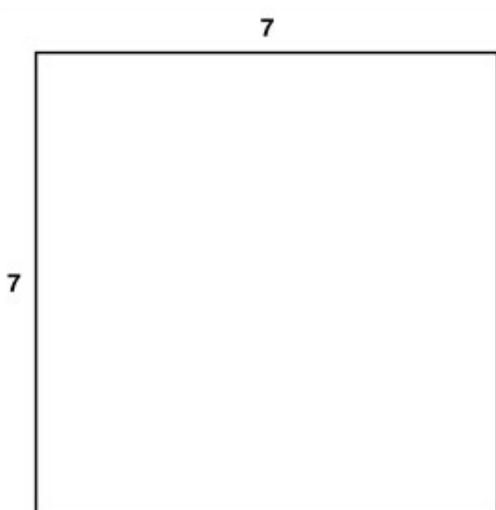
- A. 3.5
- B. $\sqrt{14}$
- C. 7
- D. 49

82. If $8^2 = 64$, which statement is true?

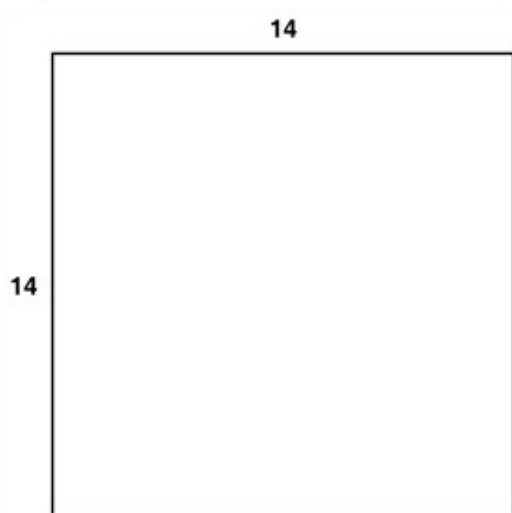
- A. $\sqrt{8} = 64$
- B. $\sqrt{64} = 8$
- C. $81 = 8^2$
- D. $64^2 = 8$

83. Which model best represents $\sqrt{196}$?

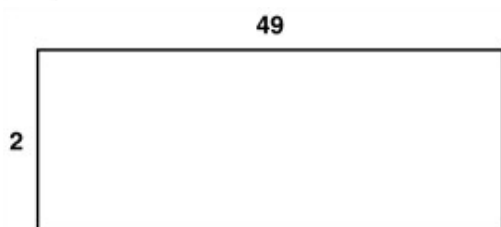
A.



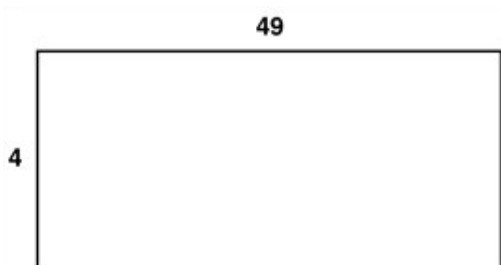
B.



C.



D.



84. Chris folded a rectangular sheet of paper along its diagonal. He calculated that the length of the diagonal was four times the square root of forty-one inches. Which of the following is equivalent to four times the square root of forty-one?
- A. $4(41)^2$
 - B. $\sqrt{4(41)}$
 - C. $4\sqrt{41}$
 - D. $(4)^2 41$
85. Which situation requires the use of the cube root?
- A. determining the surface area of a cube given the side
 - B. determining the volume of a cube given the side
 - C. determining the side of a cube given the volume
 - D. determining the volume of a sphere given the radius
86. What number is $\sqrt[3]{64}$ equivalent to?
- A. 4
 - B. 6
 - C. 8
 - D. $21\frac{1}{3}$
87. In the equation $x^3 = 8$, what is the value of x ?
- A. 2
 - B. 24
 - C. 32
 - D. 512
88. What is the solution to $x^2 = 16$?
- A. $x = -4$ or $x = 4$
 - B. $x = -8$ or $x = 8$
 - C. $x = -32$ or $x = 32$
 - D. $x = -256$ or $x = 256$
89. The volume of a cube is 125 cubic centimeters. How many centimeters long is each edge of the cube?
- A. 5 centimeters
 - B. 11 centimeters
 - C. 15 centimeters
 - D. 42 centimeters

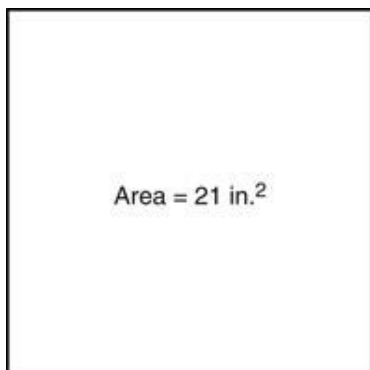
90. Given the area of a square, which mathematical operation is required to find the length of the side of the square?

- A. addition
- B. subtraction
- C. cube root
- D. square root

91. What is the value of x in the equation $512x^3 = 8$?

- A. $\sqrt[3]{\frac{1}{4}}$
- B. $\frac{1}{4}$
- C. $\sqrt[3]{4}$
- D. 4

92. The figure below represents a square with an area of 21 square inches.



Which value below represents the side length of this square, in inches?

- A. $\sqrt{21^2}$
- B. $\frac{21}{2}$
- C. $\frac{21}{4}$
- D. $\sqrt{21}$

93. What value of x makes the equation true?

$$x^3 = 27$$

- A. 2
- B. 3
- C. 9
- D. 24

94. Laura makes an ice cube having a volume of $\frac{27}{64}$ cubic inch. What is the side length of the ice cube?

- A. $\frac{9}{64}$ in.
- B. $\frac{3}{4}$ in.
- C. 3 in.
- D. 4 in.

95. What is the value of x in the equation $x^2 = 49$?

- A. 4
- B. 7
- C. 25
- D. 98

96. The perimeter of one face of a cube may be found by using the formula $P = 4V^{\frac{1}{3}}$, where P is the perimeter of one face and V is the volume of the cube. What is the perimeter of one face of a cube with a volume of 27 cubic inches?

- A. 3 inches
- B. 12 inches
- C. 24 inches
- D. 36 inches

97. The volume of a cube is 125 cm^3 . What is the length of each side of the cube?

- A. 5 cm
- B. 11.18 cm
- C. 25 cm
- D. 31.25 cm

98. What is the value of x in the equation $x = \sqrt[3]{27}$?

- A. $x = 3$
- B. $x = 9$
- C. $x \pm 3$
- D. $x \pm 9$

99. Which value is equivalent to $\sqrt{5^2}$?

- A. 2.5
- B. $\sqrt{10}$
- C. 5
- D. 25

100. What is the value of $\sqrt{36}$?

- A. 18
- B. 9
- C. 6
- D. 4

101. If $x^2 = 81$ then $x = 9$ or $x = -9$. Which equation shows why this statement is correct?

A. $9^2 = (-9^2)$

B. $\sqrt{81} = \sqrt{-81}$

C. $(9)(-9) = (9)(-9)$

D. $\frac{-81}{9} = \frac{81}{-9}$

102. When is x^2 greater than x^3 ?

A. always

B. never

C. when $x < 0$

D. when $x > 1$

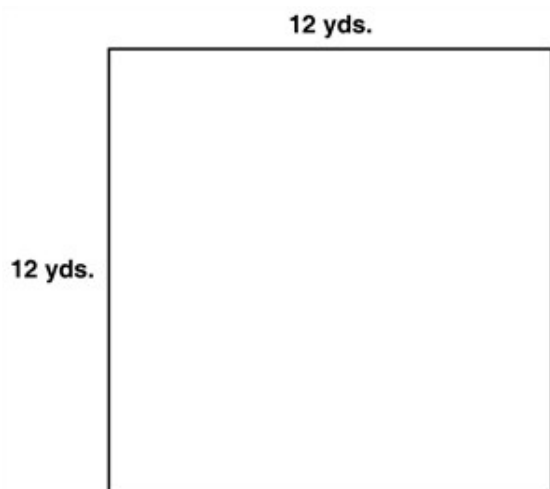
103. What is the value of x in the equation $x^2 = 49$?

A. 7

B. 12

C. 25

104. The diagram below is a mathematical model.



Which expression is best represented by the model?

- A. 12×2
- B. 12×4
- C. 12^2
- D. 144^2

105. Erin knows that the length of the side of her square garden, in feet, is twice the square root of 121 or $2(\sqrt{121})$. What is the length of Erin's garden?

- A. 11 feet
- B. 22 feet
- C. 44 feet
- D. 242 feet

106. How should the number $\sqrt{2}$ be read?

- A. two
- B. two squared
- C. the square root of two
- D. the square root of two squared

107. Which equation has an irrational solution?

- A. $x^2 = 2$
- B. $x^2 = 81$
- C. $x^3 = 27$
- D. $x^3 = 64$

108. The side lengths of four squares are represented in two different ways in the table below.

Four Squares

Square A	2 units	$\sqrt{4}$ units
Square B	4 units	$\sqrt{16}$ units
Square C	5 units	$\sqrt{25}$ units
Square D	7 units	$\sqrt{49}$ units

What is another way to represent the side length of a square with a side length of 11 units?

- A. $\sqrt{11}$
- B. $\sqrt{55}$
- C. $\sqrt{121}$
- D. $\sqrt{144}$

109. The surface area of a cube is $1,944 \text{ cm}^2$. What is the height of the cube?

- A. 16 cm
- B. 18 cm
- C. 243 cm
- D. 324 cm

110. A square has an area of 64 square units. A cube has a volume of 64 cubic units. What is the difference in the side length of the square and the length of one edge of the cube?

- A. 0 units
- B. 2 units
- C. 4 units
- D. 8 units

111. What is the value of p in the equation $p^2 = \frac{1}{25}$?

- A. $\frac{1}{12}$
- B. $\frac{1}{5}$
- C. 5

112. Which value is equivalent to $\sqrt{11^2}$?

- A. 121
- B. 11
- C. $\sqrt{22}$
- D. 6.5

113. Which expression has a value of 12?

- A. $4\sqrt{9}$
- B. $\sqrt{12} + \sqrt{12}$
- C. $\sqrt{4} + \sqrt{4} + \sqrt{4}$
- D. $2\sqrt{6}$

114. Which expression has a value of 10?

- A. $\sqrt[3]{13}$
- B. $\sqrt{5}$
- C. $\sqrt[3]{30}$
- D. $\sqrt{100}$

115. What is the square root of 0.16?

- A. 0.0256
- B. 0.04
- C. 0.256
- D. 0.4

116. What would be the seventh term in the square root pattern below?

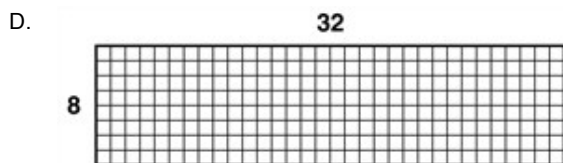
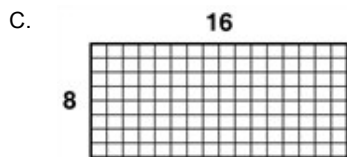
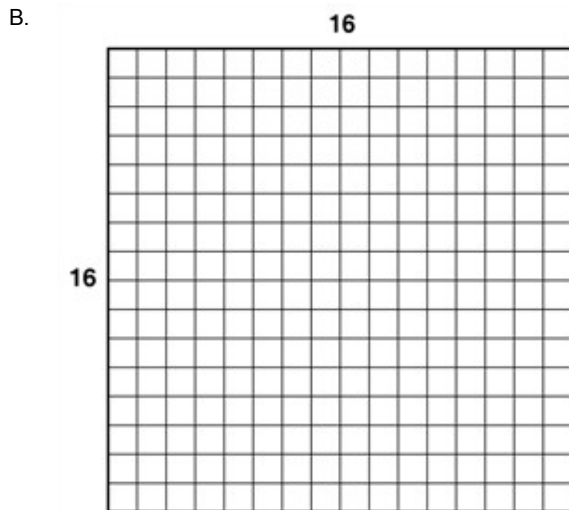
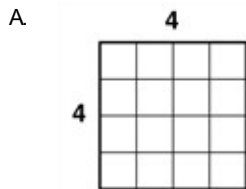
$\sqrt{144}, \sqrt{121}, \sqrt{100}, \sqrt{81} \dots$

- A. $\sqrt{25}$
- B. $\sqrt{36}$
- C. $\sqrt{49}$
- D. $\sqrt{64}$

117. Which situation requires a square root operation?
- A. calculating the radius of a circle given its area
 - B. calculating the height of a cube given its volume
 - C. calculating the diameter of a circle given its circumference
 - D. calculating the height of a cylinder given the area of the base

118. What is the sum of $\sqrt{121}$ and $\sqrt{225}$?
- A. 18
 - B. 26
 - C. 173
 - D. 346

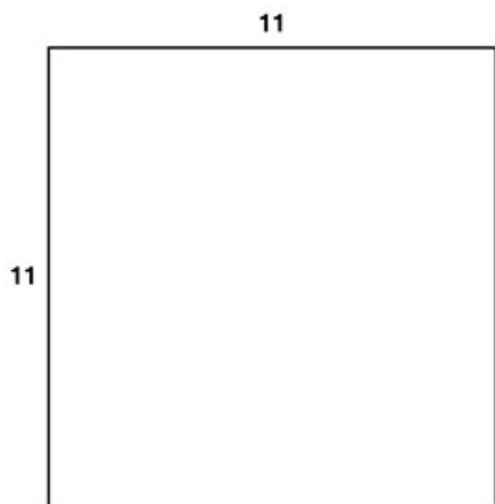
119. Which model best represents $\sqrt{256}$?



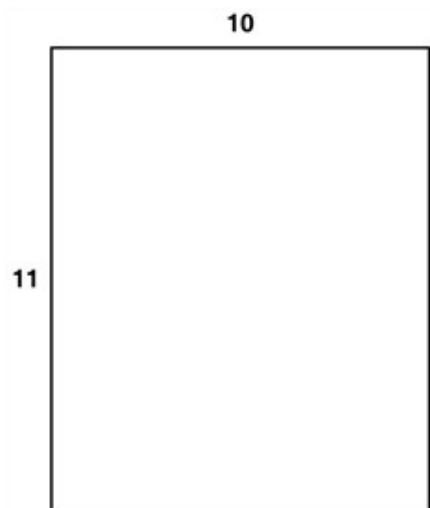
120. Aashi needs to solve $\sqrt{121}$ on her math homework. Which one of these models would be best for her to

use?

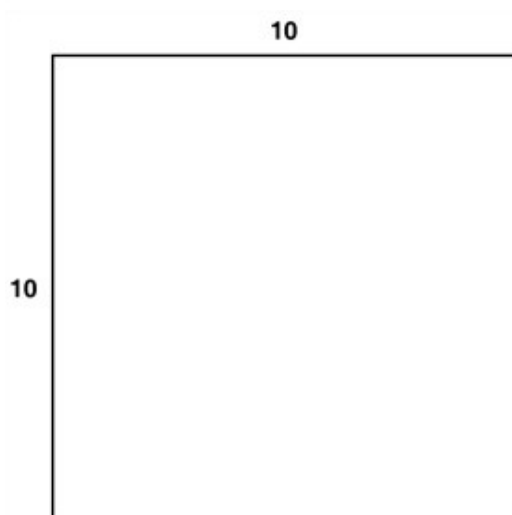
A.



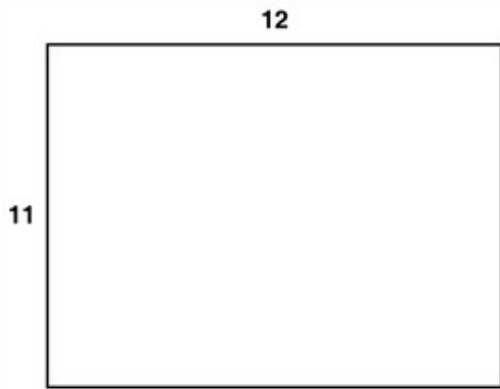
B.



C.



D.



121. The area of a square is 196 in.^2 . What is the length of one side of the square?

- A. 6 in.
- B. 14 in.
- C. 49 in.
- D. 98 in.

122. The number $\sqrt{10}$ can be represented by which of the following geometric models?

- A. The perimeter of a square with an area of 100 square units
- B. The side of a square with a perimeter of 10 units
- C. The perimeter of a square with sides of $\frac{\sqrt{10}}{4}$ units in length
- D. The side of a square with an area of 10 square units

123. Which of the following is equivalent to $\sqrt{196}$?

- A. $\sqrt{14}$
- B. $7\sqrt{2}$
- C. 14
- D. 98

124. What is the value of $\sqrt{\frac{1}{4}}$?

- A. $\frac{1}{16}$
- B. $\frac{1}{8}$
- C. $\frac{1}{2}$

125. Which statement is true?

A. $\sqrt{2}$ is rational because it can be written as an integer.

B. $\sqrt{2}$ is rational because it can be written as $\frac{a}{b}$ or $\frac{-a}{b}$ where a and b are integers and $b \neq 0$.

C. $\sqrt{2}$ is irrational because it cannot be written as a terminating decimal.

D. $\sqrt{2}$ is irrational because it cannot be written as $\frac{a}{b}$ where a and b are integers and $b \neq 0$.

126. Which expression has a value that is irrational?

A. 2^2

B. $\sqrt{4}$

C. $2\sqrt{2}$

D. $(\sqrt{2})^2$

127. What is the value of x when $\sqrt{x} = 20$?

A. 20

B. 40

C. 200

D. 400

128. Given $5 = \sqrt{25}$, which statement is true?

A. $25^2 = 5$

B. $\sqrt{5} = 25$

C. 25 is the area of a square whose side has length 5.

D. 25 is the perimeter of a square whose side has length 5.

129. If $y^2 = 100$, what is one possible value of y ?

- A. 10
- B. 50
- C. 200
- D. 10,000

130. The volume of a cube is 64 cm^3 . What is the length of one side of the cube?

- A. 4 cm
- B. 8 cm
- C. 16 cm

131. Which statement is justified by $14^2 = 196$?

- A. 14 is a perfect square.
- B. 196 is a perfect square.
- C. $\sqrt{14} = 196$
- D. $196^2 = 14$