

TEST NAME: **8th Exponents Bank V1**
TEST ID: **49073**
GRADE: **08**
SUBJECT: **Mathematics**
TEST CATEGORY: **My Classroom (Individual Teacher Assessments)**

Student: _____

Class: _____

Date: _____

1. Simplify completely.

$$\frac{2^3}{2^5}$$

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

2. Which of the following is equivalent to $2^6 \cdot 2^{-3}$?

- A. 2^{-18}
- B. 2^{-2}
- C. 2^3
- D. 2^9

3. Compute:

$$11^2 - (12 - 4)^2 + 3 =$$

- A. -36
- B. -4
- C. 60
- D. 96

4. Which choice has the same value as 7^{-3} ?

- A. -21
- B. $\frac{-3}{7}$
- C. $\frac{1}{21}$
- D. $\frac{1}{7 \cdot 7 \cdot 7}$

5. Which of the following is equivalent to $5^{-4} \times 5^{-5}$?

- A. 5^{20}
- B. 5^{-1}
- C. 5^{-9}
- D. 5^{-20}

6. What is the value of $\frac{4^4 \cdot 4^3}{4^6}$?

- A. 4
- B. 16
- C. 64
- D. 4096

7. Select *all* expressions that have a value between 0 and 1.

- A. $6^2 \cdot 6^{-10}$
- B. $\frac{8^4}{8^{-2}}$
- C. $\left(\frac{1}{4}\right)^2 \cdot \left(\frac{1}{4}\right)^4$
- D. $\frac{-4^8}{-4^{12}}$

8. Which of the following has the same value as the expression below?

$$\frac{4^{-4} \cdot 4^{-6}}{4^{-2}}$$

- A. 4^{-12}
- B. 4^{-8}
- C. 4^{-4}
- D. 4^5

9. Simplify the following product:

$$(-3)^4 \cdot (-3)^6 \cdot (-3)$$

- A. $(-27)^{11}$
- B. $(-3)^{11}$
- C. $(3)^{11}$
- D. $(27)^{11}$

10. Simplify the quotient.

$$\frac{7^8}{7^3}$$

- A. 5
- B. 8
- C. 7^5
- D. 7^{11}

11. What is the value of $\frac{6^7 \cdot 4^4 \cdot 2}{6^5 \cdot 4^4 \cdot 2^2}$?

A. $\frac{1}{18}$

B. $\frac{4}{2}$

C. $\frac{36}{4}$

D. 18

12. $12^5 \cdot 12^4$

A. 12^9

B. 12^{20}

C. 144^9

D. 144^{20}

13. Simplify the expression:

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

A. 2^{-1}

B. $\frac{1}{2}$

C. $\frac{1}{32}$

D. $\frac{1}{2^{-1}}$

14. Which of the following is the equivalent to $4^{-2} \times 4^{-1}$?

A. 16

B. $\frac{1}{4}$

C. $\frac{1}{16}$

D. $\frac{1}{64}$

15. Which number equals $(2)^{-3}$?

A. -2^3

B. $\frac{1}{-2^3}$

C. $\frac{1}{2^3}$

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

16. Evaluate.

$$5^0 \cdot 5^2$$

- A. 0
- B. 10
- C. 25
- D. 625

17. Which value is equivalent to $\frac{7^{-3}}{7^{-5}}$?

- A. 7^{-2}
- B. 7^2
- C. 7^8
- D. 7^{15}

18. Solve:

$$\frac{9^0}{9^{-2}}$$

- A. $\frac{1}{81}$
- B. $\frac{1}{9}$
- C. 81
- D. 729

19. Simplify.

$$\frac{5^4 \cdot 8^{-6} \cdot 9^{-12}}{5^{-2} \cdot 8^3 \cdot 9^{-4}}$$

- A. $\frac{5^2}{8^3 \cdot 9^{16}}$
- B. $\frac{9^3}{5^2 \cdot 8^2}$
- C. $\frac{5^6}{8^9 \cdot 9^8}$
- D. $\frac{5^8}{8^{18} \cdot 9^3}$

20. Solve:

$$\frac{12^{-3}}{12^{-9}}$$

- A. 12^{-12}
- B. 12^{-6}
- C. 12^3
- D. 12^6

21. Simplify the expression:

$$\frac{4^5}{4^{-6}}$$

- A. $-\frac{1}{4}$
- B. $\frac{1}{4}$
- C. 4^{11}
- D. 4^{30}

22. Which of the following has the same value as $5^2 \times 5^3$?

- A. 5^5
- B. 5^6
- C. 25^5
- D. 25^6

23. Which value is equivalent to $\frac{2^8 \cdot 5^9 \cdot 10^4}{2^5 \cdot 5^8 \cdot 10^7}$?

- A. $\frac{1}{25}$
- B. 1
- C. 10
- D. 100

24. How do you write this as a power?

$$8 \times 8 \times 8 \times 8 \times 8 \times 8$$

- A. 8^{-6}
- B. 8^6
- C. 6^8
- D. 8^7

25. Simplify:

Which value is equivalent to $\frac{5^{12}}{5^3}$?

- A. 4
- B. 9
- C. 5^4
- D. 5^9

26. Which value is equivalent to $\frac{4^{-8}}{4^{-6}}$?

- A. 4^2
- B. 4
- C. 4^{-2}
- D. 4^{-14}

27. Simplify:

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

- A. -2
- B. $\frac{2}{9}$
- C. $3\frac{3}{8}$
- D. $\frac{8}{27}$

28. Simplify the expression.

$$8(3)^6 \cdot (3)^{-3}$$

- A. -1296
- B. -72
- C. 216
- D. 648

29. Find the product in simplest form:

$$\frac{12}{19} \cdot \frac{5}{14}$$

- A. $\frac{60}{266}$
- B. $\frac{30}{133}$
- C. $\frac{17}{33}$
- D. $\frac{95}{168}$

30. Find the product in simplest form:

$$5\frac{6}{7} \cdot 9\frac{14}{15}$$

- A. $\frac{6109}{105}$
- B. $58\frac{19}{105}$
- C. $45\frac{28}{35}$
- D. $45\frac{84}{105}$

31. Which value is equivalent to $\frac{6^3 \cdot 2^2 \cdot 3^4}{6^2 \cdot 2^4 \cdot 3^5}$?

A. $\frac{1}{72}$

B. $\frac{1}{2}$

C. 1

D. 2

32. Which of the following has the same value as $6^{-10} \times 6^3$?

A. 6^{-30}

B. 6^{-7}

C. 6^{13}

D. 6^{30}

33. Find the equivalent to:

$$\frac{7^3 \cdot 7^{-2}}{7^5}$$

A. $\frac{7^{-6}}{7^5}$

B. $\frac{7}{7^5}$

C. $\frac{7^3}{7^{10}}$

D. $\frac{7^5}{7^6}$

34. Find the amount with the same value as:

$$2^0 \cdot 2^{-3}$$

A. $\frac{1}{8}$

B. $\frac{1}{4}$

C. 1

D. -8

35. Which value is equivalent to 4^{-3} ?

A. -64

B. -12

C. $-\frac{1}{64}$

D. $\frac{1}{64}$

36. Simplify the following expression.

$$-(2)^{-4}$$

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

37. Evaluate the expression.

$$(-4 \times 2)^{-2}$$

- A. $\frac{1}{64}$
- B. $\frac{1}{32}$
- C. $\frac{1}{16}$
- D. 64

38. The expression 10^{-2} is equivalent to _____.

- A. 0.0010
- B. 0.01
- C. 5
- D. 0.10

39. Find the answer with the same value as 4^{-2} .

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

40. Simplify.

$$10^{-4}$$

- A. $\frac{1}{40}$
- B. $\frac{1}{10,000}$
- C. -40
- D. -10,000

41. Solve:

$$6^{-1} \times 6^5$$

- A. $\frac{1}{7776}$
- B. $\frac{1}{1296}$
- C. 1296
- D. 7776

42. What is the value of $\frac{8^2 \cdot 4^6 \cdot 2^3}{8^3 \cdot 4^4 \cdot 2^5}$?

- A. $\frac{1}{64}$
- B. $\frac{1}{4}$
- C. $\frac{1}{2}$
- D. 1

43. Find the quotient in reduced form:

$$9\frac{2}{3} \div 3\frac{1}{6}$$

- A. $3\frac{1}{19}$
- B. $\frac{58}{19}$
- C. $\frac{551}{18}$
- D. $30\frac{11}{18}$

44. Simplify the expression using the correct order of operations:

$$14(2 + 3 - 2 \cdot 2) \div (4^2 - 3^2)$$

- A. 2
- B. 4.29
- C. 5.29
- D. 18

45. Which value is equivalent to $8^3 \cdot 8^7$?

- A. 8^{10}
- B. 8^{21}
- C. 64^{10}
- D. 64^{21}

46. Which choice has the same value as $\frac{1}{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2}$?

- A. 2^{-6}
- B. $\frac{1}{12}$
- C. $\frac{2}{6}$
- D. -12

47. Simplify the following product:

$$-\frac{4}{5} \cdot \left(-\frac{4}{5}\right)^2$$

- A. $\frac{4}{5}$
- B. $\left(-\frac{4}{5}\right)^2$
- C. $\left(-\frac{4}{5}\right)^3$
- D. $\left(\frac{4}{5}\right)^2$

48. Which value is equivalent to $\frac{3^5 \cdot 3^3}{3^4}$?

- A. 9
- B. 12
- C. 27
- D. 81

49. Which of the following has the same value as $\frac{9^{-1} \cdot 9^2}{9^{-3}}$?

- A. 9^{-2}
- B. 9^1
- C. 9^4
- D. 9^6

50. Which of the following is equivalent to $\frac{9^{-4}}{9^6 \cdot 9^{-2}}$?

- A. 1
- B. $\frac{1}{9^3}$
- C. $\frac{1}{9^8}$
- D. $\frac{1}{9^{16}}$

51. Frank is investigating the numerical value of $2^x \cdot 2^y$ when x and y are both integers. He makes the following two claims.

Claim 1: When x and y are both negative integers, the value of $2^x \cdot 2^y$ is always a non-whole number. For example, $2^{-1} \cdot 2^{-1} = 0.25$ and $2^{-5} \cdot 2^{-1} = 0.015625$.

Claim 2: When only one of x or y is a negative integer, the value of $2^x \cdot 2^y$ is always a non-whole number. For example, $2^2 \cdot 2^{-3} = 0.5$ and $2^{-5} \cdot 2^1 = 0.0625$.

Which statement correctly classifies Frank's claims?

- A. Frank is correct in both Claim 1 and Claim 2 as both pairs of examples prove the given claims.
- B. Frank is incorrect in both Claim 1 and Claim 2 since both pairs of examples are not sufficient to prove the given claims.
- C. Frank is correct in Claim 1 but is incorrect in Claim 2 as the value of $2^x \cdot 2^y$ can be a whole number when only one of x or y is negative.
- D. Frank is incorrect in Claim 1 since the value of $2^x \cdot 2^y$ is sometimes a whole number when x and y are both negative but is correct in Claim 2.

52. $4^4 \div 4^3 =$ _____

- A. $\frac{4}{4}$
- B. 4^7
- C. 4
- D. 4^{12}

53. Which of the following has the same value as $10^{-6} \times 10^4$?

- A. $\frac{10^6}{10^4}$
- B. $\frac{1}{10^{24}}$
- C. 10^{-24}
- D. $\frac{1}{10^2}$

54. What is 2^{-2} equal to?

- A. -4
- B. $-\frac{1}{16}$
- C. $\frac{1}{4}$
- D. $\frac{1}{2}$

55. Which value is equivalent to $(3^6)^3$?

- A. 3^2
- B. 3^3
- C. 3^9
- D. 3^{18}

56. Which value is equivalent to $9^3 \cdot 9^8$?

- A. 9^{11}
- B. 9^{24}
- C. 81^{11}
- D. 81^{24}

57. Simplify the product:

$$7^3 \cdot 7^4$$

- A. 7^1
- B. 7^7
- C. 7^{12}
- D. 49^7

58. Which value is equivalent to $\frac{6^{-9}}{6^3}$?

- A. 6^{-3}
- B. 6^{-6}
- C. 6^{-12}
- D. 6^{-27}

59. $5^{-4} =$

- A. -20
- B. $\frac{1}{20}$
- C. $-5 \cdot -5 \cdot -5 \cdot -5$
- D. $\frac{1}{5 \cdot 5 \cdot 5 \cdot 5}$

60. Which of these equations are correct? Select *three* that apply.

- A. $\frac{2^4}{2^8} = \frac{1}{16}$
- B. $\frac{3^6}{3^4} = \frac{1}{9}$
- C. $\frac{4^9}{4^3} = 64$
- D. $\frac{5^8}{5^6} = 25$
- E. $\frac{6^7}{6^1} = 36$
- F. $\frac{8^2}{8^5} = \frac{1}{512}$

61. Which of the following has the same value as $\frac{5^{-3}}{5^{-2}}$?

A. $\frac{-15}{-10}$

B. $\frac{-125}{-25}$

C. $\frac{5}{1}$

D. $\frac{25}{125}$

62. Find the product in simplest form:

$$\frac{5}{18} \cdot \frac{8}{12}$$

A. $\frac{40}{216}$

B. $\frac{10}{54}$

C. $\frac{20}{108}$

D. $\frac{5}{27}$

63. Simplify.

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

A. $-\frac{1}{6}$

B. $\frac{1}{9}$

C. 6

D. 9

64. Which expression is equivalent to $10^8 \times 10^9$?

A. 100^{72}

B. 100^{17}

C. 10^{72}

D. 10^{17}

65. Evaluate the expression:

$$3^{-2} \cdot 3^2$$

A. $\frac{1}{81}$

B. 1

C. 3

D. 81

66. Which expression is equivalent to $6^3 \times 6^6$?

- A. 6^9
- B. 6^{18}
- C. 36^9
- D. 36^{18}

67. Simplify.

$$11^{-2}$$

- A. $\frac{1}{22}$
- B. $\frac{1}{121}$
- C. -22
- D. -121

68. Which expression is equivalent to $2^{-4} \times 2^8$?

- A. $\frac{1}{16}$
- B. 4
- C. 16
- D. 4096

69. Which of the following is equivalent to $3^{-8} \cdot 3^4$?

- A. 3^{-2}
- B. 3^{-4}
- C. 3^{-12}
- D. 3^{-32}

70. Simplify:

$$7^{-2}$$

- A. 49
- B. $\frac{1}{49}$
- C. $-\frac{7}{2}$
- D. -14

71. Which of the following is equivalent to $(2^{-4} \cdot 2^3)^3$? Select *all* that apply.

- A. $\frac{1}{8}$
- B. 8
- C. $2^{-12} \cdot 2^9$
- D. $2^{-1} \cdot 2^6$

72. Simplify:

$$3(8)^0 \cdot (3)^{-2}$$

- A. $\frac{24}{9}$
- B. -27
- C. $\frac{1}{3}$
- D. -216

73. Find the product in simplest form:

$$\frac{1}{2} \cdot \frac{2}{9}$$

- A. $\frac{1}{9}$
- B. $\frac{3}{11}$
- C. $\frac{2}{18}$
- D. $\frac{4}{9}$

74. Compute.

$$11^2 - (12 - 4)^2 + 3$$

- A. -36
- B. -4
- C. 60
- D. 96

75. Priscilla is investigating the values of $(5^r)(5^s)$ and $(5^r)^s$ where r and s are nonzero integers. She makes the following claims.

Claim 1: When r is a negative integer and s is a positive integer, the value of $(5^r)(5^s)$ can never be a whole number. For example, the value of $(5^{-5})(5^3)$ is 0.04.

Claim 2: When r is a negative integer and s is a positive integer, the value of $(5^r)^s$ can never be a whole number. For example, the value of $(5^{-4})^1$ is 0.0016.

Which statement correctly classifies Priscilla's claims?

- A. Priscilla is correct in both claims as the provided example proves each associated claim.
- B. Priscilla is incorrect in both claims since the provided example is not sufficient to prove each associated claim.
- C. Priscilla is correct in Claim 1 but is incorrect in Claim 2 as the value of $(5^r)^s$ can be a whole number when r is negative and s is positive.
- D. Priscilla is incorrect in Claim 1 as the value of $(5^r)(5^s)$ can be a whole number when r is negative and s is positive but is correct in Claim 2.

76. Which of the following has the greatest value?

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

77. Simplify.

$$5^{-5} \times 5^4$$

- A. 5^{-20}
- B. 5^{-1}
- C. 5^1
- D. 5^9

78. Find the equivalent for $-(3)^{-4}$?

- A. $-(4 \cdot 4 \cdot 4)$
- B. $-3 \cdot -4$
- C. $\frac{1}{-3 \cdot -3 \cdot -3 \cdot -3}$
- D. $-\left(\frac{1}{3} \cdot \frac{1}{3} \cdot \frac{1}{3} \cdot \frac{1}{3}\right)$

79. Which of the following expressions is equivalent to $\frac{4^{-6} \cdot 5^4}{4^3 \cdot 5^{-2}}$?

- A. $\frac{5^2}{4^3}$
- B. $\frac{5^6}{4^9}$
- C. $\frac{5^2}{4^9}$
- D. $\frac{1}{4^2 \cdot 5^2}$

80. Simplify the expression using the correct order of operations:

$$23 - (17 - 3 \cdot 4)^2 + 6.25$$

- A. -3106.75
- B. -131.75
- C. 4.25
- D. 24.25

81. Which number equals $(3)^{-3}$?

- A. -27
- B. -9
- C. $\frac{1}{27}$
- D. $\frac{1}{9}$

82. Find the quotient in simplest form:

$$\frac{5}{7} \div \frac{1}{2}$$

- A. $\frac{10}{7}$
- B. $\frac{2}{3}$
- C. $1\frac{3}{7}$
- D. $\frac{5}{14}$

83. $5^3 \cdot 5^4 =$ _____

- A. 5^{12}
- B. $8 \cdot 9$
- C. 5^7
- D. 25^{12}

84. Which number equals $(5)^{-3}$?

- A. -125
- B. -15
- C. $\frac{1}{125}$
- D. $\frac{1}{15}$

85. Evaluate:

$$\left(-\frac{2}{5}\right)^2$$

- A. $-\frac{25}{4}$
- B. $-\frac{4}{25}$
- C. $\frac{4}{10}$
- D. $\frac{4}{25}$

86. Simplify.

$$2^5 \cdot 2^{-4}$$

- A. $\frac{1}{2}$
- B. 2
- C. 2^{-9}
- D. 2^{-20}

87. What is $2^3 \cdot 5^3$?

- A. 40
- B. 90
- C. 1000
- D. 2187

88. Which value of x will make this expression true?

$$7^5 \cdot 7^x = 7^{15}$$

- A. 3
- B. 4
- C. 10
- D. 20

89. What is the value of $5^2 + 5^{-2}$?

- A. -625
- B. 0
- C. 1
- D. $\frac{626}{25}$

90. Find the quotient in simplest form:

$$9\frac{2}{3} \div 3\frac{1}{6}$$

- A. $3\frac{1}{19}$
- B. $\frac{58}{19}$
- C. $\frac{551}{18}$
- D. $30\frac{11}{18}$

91. Evaluate:

$$(2^{-2})^{-2}$$

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

92. Which of the following has the same value as $2^{-4} \times 2^5$?

- A. $\frac{1}{2^1}$
- B. 2^{-9}
- C. 2^{-20}
- D. 2

93. Which of these expressions are equivalent to $\frac{2^2}{2^8}$? Select *two* that apply.

- A. -2^4
- B. 2^{-6}
- C. $-\left(\frac{1}{2}\right)^6$
- D. $\left(\frac{1}{2}\right)^4$
- E. $\frac{1}{64}$
- F. 16

94. Which expression is equal to 16?

- A. $\frac{4^{14}}{4^7}$
- B. $\frac{32^2}{2^2}$
- C. $\frac{8^6}{8^4}$
- D. $\frac{2^9}{2^5}$

95. Simplify the quotient:

$$\frac{(-2)^4}{-2}$$

- A. $\frac{1}{2^3}$
- B. $(-2)^3$
- C. $(2)^3$
- D. 1^4

96. $(8^{10})^2$

- A. 8^{20}
- B. 8^{12}
- C. 8^8
- D. 8^5

97. Simplify.

$9^1 \times 9^{-3}$

- A. $\frac{1}{729}$
- B. $\frac{1}{81}$
- C. 729
- D. 6561

98. What is the value of $\frac{9^6 \cdot 9^4}{9^{12}}$?

- A. 81
- B. 1
- C. $\frac{1}{9}$
- D. $\frac{1}{81}$

99. Which expression is equal to 200?

- A. $\frac{2^7 \cdot 5^2}{2^4 \cdot 5^4}$
- B. $\frac{2^9 \cdot 5^8}{2^3 \cdot 5^4}$
- C. $\frac{2^{10} \cdot 5^7}{2^7 \cdot 5^5}$
- D. $\frac{2^7 \cdot 3^6}{2^2 \cdot 3^4}$

100. Which of the following is closest to 0?

- A. $(35)^{\frac{1}{5}}$
- B. $(27)^0$
- C. $\frac{1}{3^{-5}}$
- D. $\frac{1}{2^{40}}$

101. Which of these equations is correct? Select *three* that apply.

- A. $(2^2)^4 = 2^6$
- B. $(3^5)^{-2} = \frac{1}{3^{-10}}$
- C. $(4^{-4})^2 = 4^{-8}$
- D. $(5^{-3})_6 = \frac{1}{5^{18}}$
- E. $(6^{-5})^{-3} = 6^{15}$
- F. $(8^3)^2 = 8^9$

102. Simplify.

$$3^{-3}$$

- A. -27
- B. -9
- C. $-\frac{1}{27}$
- D. $\frac{1}{27}$

103. Which value is equivalent to $\frac{8^{12}}{8^2}$?

- A. 1
- B. 5
- C. 8^6
- D. 8^{10}

104. Which of these equations is correct? Select *three* that apply.

- A. $2^{-2} \times 2^8 = 64$
- B. $3_{-5} \times 3_1 = \frac{1}{81}$
- C. $4^4 \times 4^{-3} = 4$
- D. $5_3 \times 5_{-1} = \frac{1}{125}$
- E. $6^{-8} \times 6^6 = 36$
- F. $8_2 \times 8_{-4} = \frac{1}{16}$

105. Simplify and solve:

$$3^2 \times 3^{-3} \times 3^{-1}$$

- A. $\frac{1}{9}$
- B. $\frac{1}{729}$
- C. 9
- D. 729

106. Which value is equivalent to $\frac{9^6}{9^3}$?

- A. 2
- B. 3
- C. 81
- D. 729

107. Simplify the product:

$$(-3)^4 \cdot (-3)^6 \cdot (-3)$$

- A. $(-27)^{11}$
- B. $(-3)^{11}$
- C. $(3)^{11}$
- D. $(27)^{11}$

108. Which value is equivalent to $\frac{4^4}{4^3}$?

- A. $\frac{4}{3}$
- B. 4
- C. 4^7
- D. 4^{12}

109. Which expression is equivalent to $\frac{6^{-10}}{6^5}$?

- A. $\frac{1}{6^{15}}$
- B. $\frac{1}{6^5}$
- C. $\frac{1}{6^2}$
- D. 6^5

110. Simplify.

$$\frac{8^5}{8^{-9}}$$

- A. 8^{-45}
- B. 8^{-4}
- C. 8^{14}
- D. 8^{45}

111. **Part I:**
Write the product $5^{-10} \times 5^7$ as a fraction by filling in the blanks below.

$$5^{-10} \times 5^7 = 5^{\square} = \left(\frac{\square}{\square} \right)^{\square} = \frac{\square}{\square}$$

Part II:
Now check your answer by using a calculator.

a. Find the value of 5^{-10} written as a decimal.

$$5^{-10} = \underline{\hspace{2cm}}$$

b. Find the value of 5^7 written as an integer.

$$5^7 = \underline{\hspace{2cm}}$$

c. Multiply the two values that you found together.

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

d. Find the value of your fraction from Part I written as a decimal.

$$\frac{\square}{\square} = \underline{\hspace{2cm}}$$

Part III:
Explain why your fraction from Part I is or is not correct.

112. **Simplify and solve:**

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

- A. $\frac{1}{3}$
- B. $\frac{1}{2187}$
- C. 3
- D. 531,441

113. **Which expression is equivalent to $7^{-4} \times 7^3$?**

- A. $\frac{1}{7^{12}}$
- B. $\frac{1}{7}$
- C. 7
- D. 7^{12}

114. Tim thinks that the following expression will only yield values that are positive.

$$x^2$$

Is Tim correct? Explain why or why not and provide three examples that prove whether or not Tim's statement is correct.

115. What is another way of expressing 2^3 ?

- A. $2 + 3$
- B. $2 \times 2 \times 2$
- C. $2 + 2 + 2$
- D. 3^2

116. Which of the following has the same value as $\frac{8^8}{8^{-4}}$?

- A. 8^{-2}
- B. 8^2
- C. 8^4
- D. 8^{12}

117. Simplify.

$$6^{-2} \times 6^0$$

- A. 0
- B. $\frac{1}{36}$
- C. 36
- D. Undefined

118. Simplify.

$$2^{-3} \div 2^5$$

- A. 2^8
- B. 2^2
- C. 2^{-2}
- D. 2^{-8}

119. Simplify. 2^{-4}

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

120. Simplify:

$$\frac{2^7 \cdot 3^{-2} \cdot 4^{-1}}{2^{-5} \cdot 3^3 \cdot 4^5}$$

- A. $\frac{2^2}{3 \cdot 4^4}$
- B. $\frac{2^{12}}{3^5 \cdot 4^6}$
- C. $\frac{2^2}{3^5 \cdot 4^6}$
- D. $2^{-35} \cdot 3^{-6} \cdot 4^{-5}$

121. Which of these expressions is equivalent to $10^{-5} \times 10^2$? Select two that apply.

- A. 100^{-3}
- B. 10^3
- C. $\left(\frac{1}{1000}\right)^{-3}$
- D. $\left(\frac{1}{10}\right)^3$
- E. $\frac{1}{1000}$
- F. 10,000

122. Simplify the expression:

$$4^4 \div 4^3$$

- A. $\frac{4}{4}$
- B. 4^7
- C. 4
- D. 4^{12}

123. Which of these is a solution to the equation $x^3 = 36$?

- A. $x = \sqrt[3]{6}$
- B. $x = \sqrt[3]{36}$
- C. $x = 6$
- D. $x = 36$

124. What is $x^3 = \frac{8}{27}$?

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

125. Which of these statements is correct? Select two that apply.

- A. A solution to the equation $x^2 = 7$ is $x = \sqrt{49}$.
- B. A solution to the equation $x^2 = 15$ is $x = \sqrt{15}$.
- C. A solution to the equation $x^2 = 38$ is $x = \sqrt[3]{38}$.
- D. A solution to the equation $x^3 = 3$ is $x = \sqrt[3]{27}$.
- E. A solution to the equation $x^3 = 10$ is $x = \sqrt{10}$.
- F. A solution to the equation $x^3 = 44$ is $x = \sqrt[3]{44}$.

126. Select two possible values for x in the equation $x^2 = 175$.

- A. $5\sqrt{7}$
- B. $5\sqrt{35}$
- C. $25\sqrt{7}$
- D. $\sqrt{175}$

127. Which of these is a solution to the equation $x^3 = 36$, $x^2 = 42$, or $x^3 = 55$? Select three that apply.

- A. $x = \sqrt{36}$
- B. $x = \sqrt{42}$
- C. $x = \sqrt{55}$
- D. $x = \sqrt[3]{36}$
- E. $x = \sqrt[3]{42}$
- F. $x = \sqrt[3]{55}$

128. Solve.

$$x^2 = 400$$

- A. 20
- B. 40
- C. 100
- D. 200

129. Aisha, Silvio, and Jim, each solved the same equation. Aisha's answer was $x = 4$, Silvio's answer was $x = 8$, and Jim's answer was $x = 16$. If either Aisha or Jim, but not Silvio, is correct, which of these equations could it be? Select three that apply.

- A. $x^2 = 4$
- B. $x^2 = 16$
- C. $x^2 = 64$
- D. $x^2 = 256$
- E. $x^3 = 8$
- F. $x^3 = 64$

130. To which of these equations is $x = \frac{1}{10}$ a solution?

A. $x^2 = \frac{1}{100}$

B. $x^3 = \frac{1}{100}$

C. $x^2 = 100$

D. $x^3 = 100$

131. To which of these equations is $x = \frac{\sqrt{6}}{3}$ a solution?

A. $x^2 = \frac{2}{3}$

B. $x^3 = \frac{2}{3}$

C. $x^2 = \frac{3}{2}$

D. $x^3 = \frac{3}{2}$

132. Select *all* possible values for x in the equation $x^2 = 48$.

A. $\sqrt{48}$

B. $24\sqrt{2}$

C. $-4\sqrt{3}$

D. $-16\sqrt{3}$

133. Select the possible values for x in the equation $x^2 = 108$.

A. $6\sqrt{3}$

B. $\sqrt{18}$

C. 54

D. $10\sqrt{8}$

134. Which of these statements is true about $\sqrt{2}$?

A. It is irrational, because it can be written as a fraction with an integer in the numerator and the denominator.

B. It is irrational, because it cannot be written as a fraction with an integer in the numerator and the denominator.

C. It is rational, because it can be written as a fraction with an integer in the numerator and the denominator.

D. It is rational, because it cannot be written as a fraction with an integer in the numerator and the denominator.

135. Simplify:

$$x^2 = \frac{81}{144}$$

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

B. $\sqrt{\frac{3}{4}}$

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

D. $\frac{3}{4}$

136. What is $x^3 = 64$?

- A. 2
- B. 4
- C. 8
- D. 16

137. Select two possible values for x in the equation $x^3 = 216$.

- A. 6
- B. $\sqrt[3]{216}$
- C. $3\sqrt[3]{24}$
- D. $6\sqrt[3]{6}$

138. Toni has a plastic container in the shape of a cube. The container holds 8 cubic inches of water.

Part A:

Write an equation to determine the side length s of the container.

Part B:

Solve the equation in part A.

139. It is important for engineers designing buildings to understand the relationship between the height and volume of the building. A taller building if not built correctly is more likely to collapse, because a small increase in height leads to a large increase in volume.

An engineer builds two building models of different sizes in the shape of square blocks. The smaller building has a height of 1 m , and a volume of 1 m^3 . The volume of the larger building is 125 m^3 .

The height of the building, represented by x , is equal to the cube root of the building's volume. The equation below can be used to find x , in meters.

$$x^3 = \text{volume}$$

Determine how much taller, in meters, the height of the larger building is than the smaller building.

140. Which of these statements are correct? Select *three* that apply.

- A. A solution to the equation $x^2 = 4$ is $x = 16$.
- B. A solution to the equation $x^2 = 64$ is $x = 4$.
- C. A solution to the equation $x^2 = 81$ is $x = 9$.
- D. A solution to the equation $x^3 = 8$ is $x = 24$.
- E. A solution to the equation $x^3 = 125$ is $x = 5$.
- F. A solution to the equation $x^3 = 216$ is $x = 6$.

141. What is $x^2 = 9$?

- A. 3
- B. 9
- C. 18
- D. 81

142. Which of these is a solution to the equation $x^2 = 5$?

- A. $x = \sqrt{3}$
- B. $x = \sqrt{5}$
- C. $x = \sqrt{7}$
- D. $x = \sqrt{10}$

143. Chloe, Ryan, and Giselle, each solved the same equation. Chloe's answer was $x = \sqrt{5}$, Ryan's answer was $x = \sqrt[3]{25}$, and Giselle's answer was $x = \sqrt[3]{5}$. If either Chloe or Giselle, but not Ryan, is correct, which of these equations could it be? Select *two* that apply.

- A. $x^2 = \frac{1}{5}$
- B. $x^2 = 5$
- C. $x^2 = 125$
- D. $x^3 = \frac{1}{5}$
- E. $x^3 = 5$
- F. $x^3 = 25$

144. Select *all* possible values for x in the equation $x^2 = 45$.

- A. $3\sqrt{5}$
- B. $15\sqrt{3}$
- C. $-9\sqrt{5}$
- D. $-\sqrt{45}$

145. Which of these is a solution to the equation $x^3 = \frac{1}{3}$?

A. $x = \frac{\sqrt[3]{3}}{3}$

B. $x = \frac{\sqrt[3]{9}}{3}$

C. $x = \sqrt[3]{3}$

D. $x = \sqrt[3]{9}$

146. Jane wants to make a tent shaped like a square box out of some material and poles she has. She has six square pieces of material to make the four sides, the roof and the floor of the tent. Each piece of material covers an area of 16 m^2 .

The length of the tent, represented by x , is equal to the square root of the area of material that is used for each side of the tent. The equation below can be used to find x , the length of the tent, in meters.

$$x^2 = \text{area of material}$$

Determine the maximum length of tent, in meters, Jane can make from the material she has.

147. Which of these is a solution to the equation $x^2 = \frac{1}{2}$?

A. $x = \frac{1}{2}$

B. $x = \frac{\sqrt{2}}{2}$

C. $x = \sqrt{2}$

D. $x = 2$