Name _____

Diagnostic Test

GRADE 7, FORM A

Expressions, Equations, and Functions

Read each question. Then mark your answer on the sheet.

1. Joan has $587.66 in a savings account. She deposits $15.50 each week and makes no withdrawals. Which expression represents the amount of money in the account in w weeks?

A $587.66w + 15.50$

B $587.66 + 15.50w$

C $587.66 + 15.50 + w$

D $(587.66 + 15.50)w$

2. Which expression is equivalent to $-\frac{2}{3}(x + 24)$?

A $-\frac{2}{3}x + 24$

B $-\frac{2}{3}x + 16$

C $-\frac{2}{3}x - 16$

D $\frac{2}{3}x - 16$

3. Which expression is equivalent to $-3y + 8 + (-5) + (-4y)$?

A $-7y + 3$

B $-7y + 13$

C $6y$

D $-4y$

4. Which shows a way to factor the expression $24 - 32x$?

A $-8(-3 + 4x)$

B $-4(-6 - 8x)$

C $4(-6 + 8x)$

D $8(-3 - 4x)$

5. Miguel joins a gym that has a $50 membership fee and charges $26.50 per month. He also joins a martial arts class that charges $18 per month and an initial fee of $36. Which expression represents Miguel's total cost after m months of membership?

A $68 + 62.50m$

B $62.50 + 68m$

C $86 + 44.50m$

D $44.50 + 86m$

6. Which expression can be used to determine the volume of water in a rain barrel after d days if there were 198.6 gallons of water in the barrel and 12.2 gallons are used each day?

A $12.2d - 198.6$

B $198.6 + 12.2d$

C $12.2 - 198.6d$

D $198.6 - 12.2d$

7. Which expression is equivalent to $-3 + (4x + 12)$?

A $4x + 9$

B $x + 9$

C $-12x - 36$

D $13x$

Expressions, Equations, and Functions

(continued)

Read each question. Then mark your answer on the sheet.

8. Which shows two ways to factor the expression $18a - 36b + 90$?

A $9(-2a + 4b - 10)$; $-9(2a - 4b + 10)$

B $6(3a - 6b + 15)$; $-6(-3a + 6b - 15)$

C $9(2a - 4b + 10)$; $-9(-2a + 4b + 10)$

D $6(-3a + 6b - 15)$; $-6(3a - 6b + 15)$

9. Which expression is equivalent to $3.8b + 12.7 - 6.4b - 8.3$?

A $2.6b - 4.4$

B $10.2b + 21$

C $-2.6b + 4.4$

D $3.8b - 2$

10. Which expression is equivalent to $\frac{2}{3}n - \left(-5 - \frac{1}{4}n\right)$?

A $\frac{11}{12}n - 5$

B $\frac{11}{12}n + 5$

C $\frac{5}{12}n + 5$

D $\frac{5}{12}n - 5$

11. Nora is 12 years old. She writes the equation $4b = 12$, where b represents her younger brother's age. How old is Nora's younger brother?

A 3 years old

B 4 years old

C 6 years old

D 8 years old

12. Roland hikes a trail that is 12.4 miles long. He hikes x miles before he takes a rest. He then hikes 3.1 miles more to the end of the trail. How far did Roland hike before his rest?

A 0.25 miles

B 4 miles

C 9.3 miles

D 15.5 miles

13. Xavier and Anya played a game. Anya scored 33 points, which is 3 less than twice the number of points that Xavier scored. Which equation represents the numbers of points that Anya and Xavier scored?

A $2x = 33 - 3$

B $3x - 2 = 33$

C $3x = 33 - 2$

D $2x - 3 = 33$

14. Chen bought five ink cartridges for his printer online and paid \$9.95 for shipping. His total cost was \$72.20. Solve the equation $72.2 = 9.95 + 5c$ to find the cost, c, of one ink cartridge.

A \$4.49

B \$12.45

C \$14.44

D \$16.43

Expressions, Equations, and Functions

(continued)

Read each question. Then mark your answer on the sheet.

15. Carmen has $35.87 on a gift card. She buys a book for $8.50. She also wants to buy a gift for her mom. Which inequality represents the amount of money, m, Carmen can spend on the gift?

A $35.87 > 8.50 + m$

B $35.87 < 8.50 + m$

C $35.87 \geq 8.50 + m$

D $35.87 \leq 8.50 + m$

16. Solve the inequality $2\frac{2}{3} + x \leq -5\frac{1}{2}$.

A $x \leq -8\frac{1}{6}$

B $x < -8\frac{1}{6}$

C $x \leq -1\frac{5}{6}$

D $x < -1\frac{5}{6}$

17. Jae practiced baseball for 1.5 hours yesterday. He wants to practice baseball at least 9 hours this week. Which inequality can Jae use to find the additional number of days, d, he must practice if each practice is 1.5 hours?

A $1.5 + 1.5d > 9$

B $1.5 + 1.5d < 9$

C $1.5 + 1.5d \geq 9$

D $1.5 + 1.5d \leq 9$

18. Which number is a solution for the inequality $-2.4t > -9.12$?

A 1.6

B 3.8

C 4.6

D 6.7

19. Latoya has $11 to spend on bowling. Shoe rental is $3.50. Each game is $2.75. What is the greatest number of games Latoya can play?

A 1 game

B 2 games

C 3 games

D 4 games

20. Solve the inequality $-3(x + 6) \leq -12$.

A $x \geq 6$

B $x \geq -2$

C $x \leq 6$

D $x \leq -2$

21. A chef has 26.75 pounds of meat. He uses 12 pounds of meat for meatloaf and 0.25 pound in each burger he makes. Which shows the correct inequality and its solution for the possible number of burgers the chef can make?

A $26.75 \leq 12 + 0.25b$;
At least 59 burgers

B $26.75 > 12 + 0.25b$;
Fewer than 59 burgers

C $26.75 < 12 + 0.25b$;
Greater than 59 burgers

D $26.75 \geq 12 + 0.25b$;
At most 59 burgers

Name _____

Diagnostic Test

GRADE 7, FORM A

Numbers and Operations

Read each question. Then mark your answer on the sheet.

22. Solve $\frac{5}{11} \div \frac{1}{2}$.

A $\frac{10}{11}$ **C** $1\frac{1}{10}$

B $\frac{5}{22}$ **D** $4\frac{2}{5}$

23. Corey has 8.74 pounds of unpopped popcorn. After movie night, she has 5.87 pounds remaining. How many pounds of popcorn did Corey use?

A 2.87 pounds

B 3.07 pounds

C 3.87 pounds

D 3.97 pounds

24. An elevator starts at the fourth floor. It moves up to the ninth floor, then down to the second floor. Which integers represent the changes in the elevator's position?

A 9 and 2

B 9 and -2

C 5 and -7

D -5 and 7

25. Which comparison is true?

A $-12 = |12|$

B $-12 > 12$

C $|-12| < 12$

D $|-12| = |12|$

26. Victor has $350 in his checking account. He pays $30 for a gift card. Which integer represents the change in Victor's account?

A 30

B -30

C 320

D -320

27. Four teams of climbers set out from basecamp. Based on their positions relative to basecamp, which team has traveled farthest below camp?

A Team A is at -200 feet.

B Team B is at 300 feet.

C Team C is at -400 feet.

D Team D is at 500 feet.

28. What is the value of the expression $-8 - (-6)$?

A -14 **C** 2

B -2 **D** 14

29. The temperature was 4°C. It dropped 12°C during the night. What is the new temperature?

A -16°C **C** 8°C

B -8°C **D** 16°C

Numbers and Operations
(continued)

Read each question. Then mark your answer on the sheet.

30. What is the product of $(-8) \cdot (6)$?

A 48 **C** -2

B 14 **D** -48

31. Which expression is equivalent to -8?

A $\frac{-32}{-4}$ **C** $\frac{24}{-3}$

B $\frac{40}{5}$ **D** $-\frac{-16}{2}$

32. A pelican flying 20.5 feet above the water's surface sees a fish swimming 4.1 feet below the surface. What is the distance between the pelican and the fish?

A 5.0 feet

B 16.4 feet

C 24.6 feet

D 84.05 feet

33. What is the value of the expression $-6\frac{3}{4} - 2\frac{2}{3}$?

A $-4\frac{1}{12}$

B $4\frac{1}{12}$

C $-9\frac{5}{12}$

D $9\frac{5}{12}$

34. Mr. Ruiz has \$378.50 taken from his account each month to pay for the loan on his car. What is the change in the account caused by 5 months of payments?

A \$75.50

B \$1,892.50

C $-$\$75.50

D $-$\$1,892.50

35. Each cat at the animal shelter gets $\frac{2}{3}$ pound of food. Allie has $8\frac{3}{4}$ pounds of cat food. How many cats can Allie feed?

A 5 **C** 11

B 9 **D** 13

36. Which of the following shows $98\frac{99}{200}$ as a decimal?

A 98.99 **C** 98.495

B $98.\overline{9}$ **D** $98.\overline{5}$

37. Which of the following shows $0.\overline{43}$ as a fraction?

A $\frac{43}{100}$

B $4\frac{3}{100}$

C $\frac{43}{9}$

D $\frac{43}{99}$

Name _____

Fractions, Decimals, Ratios, and Proportionality

Read each question. Then mark your answer on the sheet.

38. In the last 8 days, Laura has jogged 36 miles. At what rate did Laura jog each day?

A 0.22 mile per day

B 4.5 miles per day

C 28 miles per day

D 288 miles per day

39. Joey's dog eats 13.5 pounds of food in 18 days. At what rate does Joey's dog eat?

A 0.75 pounds per day

B 1.33 pounds per day

C 4.5 pounds per day

D 31.5 pounds per day

40. The table shows two brands of granola bar. Which comparison of the cost of the granola bars is true?

	Cost	Number of Bars
Brand A	$2.40	3
Brand B	$5.20	8

A Brand A costs $2.80 less per bar than Brand B.

B Brand B costs about $0.65 less per bar than Brand A.

C Brand A costs $0.56 more per bar than Brand B.

D Brand B costs $0.15 less per bar than Brand A.

41. An engineer collects information about four machines that fill jelly jars. Which machine fills jars at the fastest rate?

A Machine A: 1,200 jars in 80 minutes

B Machine B: 1,620 jars in 90 minutes

C Machine C: 1,440 jars in 60 minutes

D Machine D: 840 jars in 70 minutes

Use the table for Exercises 42–43.

x	45	63	27	108
y	20	28	12	

42. What is the constant of proportionality for the data in the table?

A $\frac{2}{5}$

B $\frac{4}{9}$

C $\frac{9}{4}$

D $\frac{5}{2}$

43. What y-value completes the table?

A 12

B 36

C 48

D 243

Fractions, Decimals, Ratios, and Proportionality
(continued)

Read each question. Then mark your answer on the sheet.

44. Which equation represents a proportional relationship between x and y?

A $y = k \times x$

B $y = k - x$

C $y = k + x$

D $y = k \div x$

45. Tia earns $18.00 for 3 hours of babysitting. How much would she earn for 7.5 hours?

A $6

B $45

C $135

D $189

46. Linh's car travels 64.75 miles on 3.5 gallons of gas. How far will it travel on 8.4 gallons?

A 18.5 miles

B 26.9 miles

C 155.4 miles

D 543.9 miles

47. Pilar can make 96 mini muffins using 8 cups of flour. How much flour would Pilar use to make 36 mini muffins?

A 3 cups

B 4.5 cups

C 12 cups

D 21.3 cups

48. Rick's school is 12 miles from the public library. The school and library are $\frac{3}{4}$ inch apart on an online map. The library is 2 inches from the hospital on the map. How far from the library is the hospital?

A 9 miles

B 16 miles

C 18 miles

D 32 miles

49. What is 5 out of 100 as a percent?

A 0.05%

B 0.5%

C 5%

D 50%

50. Which shows 65% written as a decimal and as a fraction?

A 0.65; $\frac{13}{20}$

B 6.5; $6\frac{1}{2}$

C 6.05; $6\frac{1}{20}$

D 65.00; $\frac{65}{1000}$

Fractions, Decimals, Ratios, and Proportionality

(continued)

Read each question. Then mark your answer on the sheet.

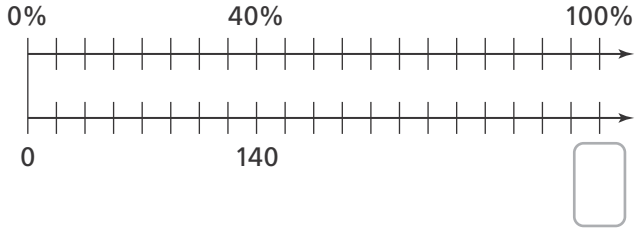
51. Of the 20 basketball games so far this year, Tracy has attended 18. What percent of basketball games has Tracy attended?

A 18%
B 20%
C 38%
D 90%

52. Which is the best estimate for 48% of 160?

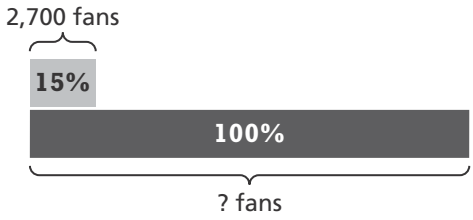
A 48
B 80
C 96
D 120

53. Carla bought a crate of red and green apples for her bakery. The crate had 140 red apples, which were 40% of the apples in the crate. How many apples were in the crate?



A 56 apples
B 196 apples
C 350 apples
D 560 apples

54. At a baseball game, 15% of the fans received free caps. If 2,700 fans received a cap, how many fans went to the game?



A 405 fans
B 3,105 fans
C 18,000 fans
D 40,500 fans

55. Kenji sees a cardboard box that is made using 30% recycled material. The empty box weighs 22 ounces. Which equation can Kenji use to calculate the amount of recycled material in the box, r?

A $30\% = 22 \times r$
B $22 \div 30\% = r$
C $30\% = 22 \div r$
D $22 \times 30\% = r$

56. The bill for lunch is $45. Anna wants to leave a 15% tip. How much money will Anna pay for lunch?

A $6.75
B $38.25
C $51.75
D $60.00

Fractions, Decimals, Ratios, and Proportionality
(continued)

Read each question. Then mark your answer on the sheet.

57. The cost of Edwin's art supplies is $64.50. The sales tax is 8%. What is the cost of the supplies with tax?

A $116.10

B $69.66

C $59.34

D $5.16

58. Peggy buys a table for $30. She later sells it for $54. What is the percent markup on the table to the nearest percent?

A 84%

B 80%

C 44%

D 24%

59. A company changes the size of their ketchup bottle from 24 ounces to 20 ounces. What is the percent change in the amount of ketchup to the nearest percent?

A 17% decrease

B 20% increase

C 83% decrease

D 120% increase

60. Four students estimate how many marbles would fill a fish bowl. Their estimates are listed in the table. The fish bowl holds 120 marbles. Which student has less than a 15% error in their estimate?

Student	Estimate
Nora	88 marbles
Kim	100 marbles
Benito	16 marbles
Emaan	130 marbles

A Nora

B Kim

C Benito

D Emaan

61. Luke put $400 into a Certificate of Deposit (CD) account that earns 1.5% simple interest each year. What will be the amount of interest earned after 5 years?

A $6

B $30

C $406

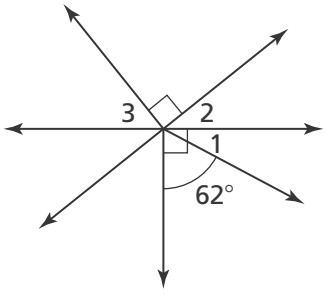
D $430

Name _____

Measurement, Geometry, Data Analysis, and Probability

Read each question. Then mark your answer on the sheet.

Use the picture for Exercises 62–63.



62. What is the measure of angle 1?

A 28°

B 38°

C 90°

D 120°

63. What is the sum of the measures of angle 2 and angle 3?

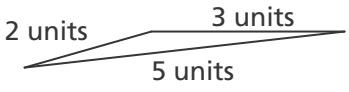
A 62°

B 90°

C 124°

D 180°

64. How should the triangle shown be classified?



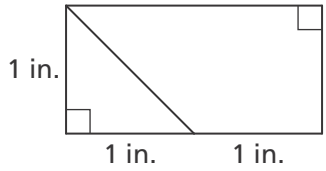
A Isosceles, Acute

B Scalene, Acute

C Isosceles, Obtuse

D Scalene, Obtuse

Use the picture for Exercises 65–66.



65. LaTonya cuts a triangle from a rectangular strip of paper. What type of triangle did LaTonya cut?

A Scalene, Right

B Scalene, Acute

C Isosceles, Right

D Isosceles, Acute

66. After LaTonya cuts the triangle, what quadrilateral is left?

A Rectangle

B Rhombus

C Parallelogram

D Trapezoid

Measurement, Geometry, Data Analysis, and Probability

(continued)

Read each question. Then mark your answer on the sheet.

67. Which statement best describes a rhombus?

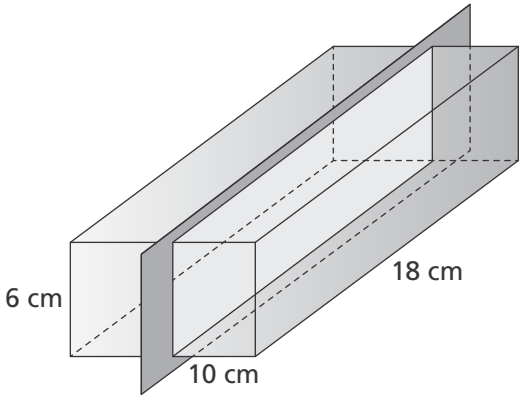
A A special parallelogram that has four sides of equal length

B A special trapezoid that has four sides of equal length

C A special parallelogram that has four right angles

D A special trapezoid that has no right angles

68. What are the dimensions of the cross section of the rectangular prism?



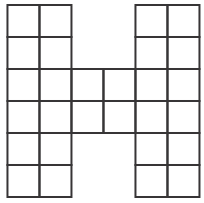
A 5 cm by 18 cm

B 10 cm by 18 cm

C 6 cm by 18 cm

D 6 cm by 10 cm

69. Hanna used 1-inch square tiles to make her initial. What is the area of the figure?



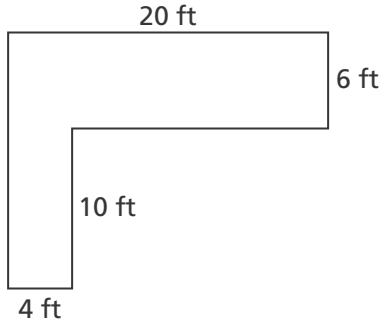
A 7 square inches

B 24 square inches

C 28 square inches

D 36 square inches

70. William wants to put artificial turf on the miniature golf hole shown. What area of artificial turf does William need?



A 80 square feet

B 160 square feet

C 184 square feet

D 320 square feet

Measurement, Geometry, Data Analysis, and Probability

(continued)

Read each question. Then mark your answer on the sheet.

71. A circular pond has a diameter of 20 feet. What is the circumference of the pond to the nearest tenth of a foot? Use 3.14 for π.

A 10.0 feet
B 31.4 feet
C 62.8 feet
D 98.6 feet

72. Marisol has 51 feet of fencing material to make a circular pen for her dog. What is the radius of the largest pen Marisol can make to the nearest foot? Use 3.14 for π.

A 8 feet
B 16 feet
C 26 feet
D 32 feet

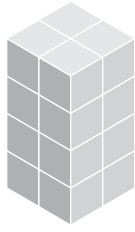
73. Chen paints a circle on his wall. The circle has a radius of 2.5 feet. What area does Chen paint to the nearest tenth of a square foot? Use 3.14 for π.

A 4.9 square feet
B 15.7 square feet
C 19.6 square feet
D 78.5 square feet

74. The daycare center where Jill works has a play parachute that is 12 feet across. When placed flat, what area does the parachute cover to the nearest tenth of a square foot? Use 3.14 for π.

A 452.2 square feet
B 113.0 square feet
C 37.7 square feet
D 18.8 square feet

75. Jason builds the rectangular prism shown using centimeter cubes. What is the volume of the rectangular prism?



A 13 cubic centimeters
B 16 cubic centimeters
C 18 cubic centimeters
D 20 cubic centimeters

Measurement, Geometry, Data Analysis, and Probability

(continued)

Read each question. Then mark your answer on the sheet.

76. A box is 8 inches tall, and its bottom has an area of 160 square inches. What is the volume of the box?

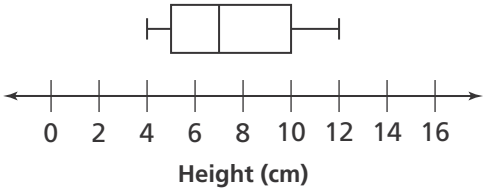
A 20 cubic inches

B 168 cubic inches

C 512 cubic inches

D 1,280 cubic inches

77. Mrs. Johnson's class made a box plot of the heights of tomato plants in the school garden. Which statement is supported by the box plot?



A One-half of the plants are between 5 and 10 centimeters tall.

B More than half of the plants are taller than 7 centimeters.

C The average height is 7 centimeters.

D The tallest plant is 16 centimeters tall.

Use the data set for Exercises 78–80.

Elena ran the following distances last week. 4 miles, 7 miles, 6 miles, 0 miles, 8 miles, 9 miles, 4 miles

78. What is the mean distance Elena ran to the nearest tenth of a mile?

A 4.0 miles

B 5.4 miles

C 6.0 miles

D 6.3 miles

79. What is the mode of the data to the nearest tenth of a mile?

A 4.0 miles

B 5.4 miles

C 6.0 miles

D 6.3 miles

80. Elena made a mistake and recorded 6 miles instead of the 8 miles she actually ran on one day. How does the change affect the range of the data?

A The range increases by 8.

B The range increases by 8 divided by 7.

C The range remains the same at 4.

D The range remains the same at 9.

Measurement, Geometry, Data Analysis, and Probability

(continued)

Read each question. Then mark your answer on the sheet.

81. The manager of a women's clothing store wants to determine which types of gloves to sell next winter. Which group would be a good representative sample in this situation?

A Ask every eighth person who buys a hat.

B Ask every third person who walks past the store.

C Ask every fifth person who buys nothing.

D Ask every fourth person who enters the store.

82. A bag contains 6 blue marbles, 2 red marbles, 4 yellow marbles, and 8 green marbles. What is the probability of drawing a red marble at random from the bag?

A 2% **C** 18%

B 10% **D** 20%

83. What is the probability of rolling a number that is 4 or greater by rolling a fair number cube that is numbered from 1 to 6?

A $\frac{1}{6}$

B $\frac{2}{6}$

C $\frac{3}{6}$

D $\frac{4}{6}$

Use the information for Exercises 84–85.

The sections of a spinner divided into five equal sections are lettered A to E. Shaelyn spins the pointer of the spinner once and rolls a number cube numbered 1 to 6 once.

84. What is the probability of landing on B and rolling an even number?

A 3.3%

B 6.7%

C 10.0%

D 20.0%

85. What is the probability of landing on a vowel and rolling a 1 or 3?

A 20.0%

B 13.3%

C 6.7%

D 3.3%