TEST NAME: **N-Q.1 NEW**
TEST ID: **1009729**
GRADE: **09 - Ninth Grade**
SUBJECT: **Mathematics**
TEST CATEGORY: **School Assessment**

Student: _____

Class: _____

Date: _____

1. Jason completed an 8 kilometer race in 40 minutes and 12 seconds. ***Approximately*** what was Jason's speed in miles per hour? (Note: 1 mile ≈ 1.6 kilometers)

   A. 5 miles per hour

   B. 7.5 miles per hour

   C. 8.5 miles per hour

   D. 10 miles per hour

2. **While riding on a carousel, Angela travels a distance of 65 meters every 15 seconds. What is her speed in kilometers per hour?**

   A. 3.9 km/hr
   B. 14.4 km/hr
   C. 15.6 km/hr
   D. 156.0 km/hr

3. Kelsey is buying carpet for his bedroom that has an area of 180 square feet. The carpet costs $15 per square yard. How much will the carpet cost?

   A. $300

   B. $500

   C. $900

   D. $2,700

4. Jessica and Greg both ran in a race. Jessica's average speed was 11.73 feet per second. Greg's average speed was 7.32 miles per hour. Which statement is true? (Note: 1 mile = 5,280 feet)

   A. Jessica's average speed was greater than Greg's by about 1 foot per second.

   B. Jessica's average speed was greater than Greg's by about 3 feet per second.

   C. Greg's average speed was greater than Jessica's by about 1 foot per second.

   D. Greg's average speed was greater than Jessica's by about 3 feet per second.

5. Brittany's dog ran 432 inches in 3 seconds. What was the dog's average speed in yards per minute?

A. 2,160 yards per minute

B. 720 yards per minute

C. 240 yards per minute

D. 86.4 yards per minute

6. A rocket travels at a rate of 406 kilometers per hour. ***Approximately*** how many meters will the rocket travel in 1 second?

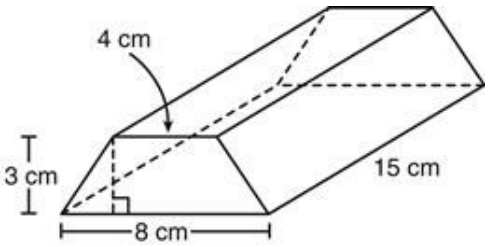
A. 7 meters

B. 12 meters

C. 113 meters

D. 338 meters

7. **Which units of measure are appropriate for finding the surface area of the figure?**



A. square centimeters

B. cubic centimeters

C. centimeters

D. millimeters

8. Karen runs at a rate of 6 miles per hour. David runs at a rate of 900 feet per minute. ***Approximately*** how many yards faster, per second, does David run than Karen? (Note: 1 mile = 1,760 yards)

A. 1 yard

B. 2 yards

C. 3 yards

D. 4 yards

9. **Tim has a cylinder that is 6 inches tall with a radius of $1\frac{1}{2}$ inches. If he calculates the volume of the cylinder, which unit should he use?**

A. feet
B. inches
C. cubic inches
D. square inches

10. **Charlotte is traveling 15 meters per second. Which expression could be used to convert this speed to kilometers per hour?**

A. $\left(\frac{15 \text{ meters}}{1 \text{ second}}\right)\left(\frac{60 \text{ seconds}}{1 \text{ minute}}\right)\left(\frac{60 \text{ minutes}}{1 \text{ hour}}\right)\left(\frac{1000 \text{ meters}}{1 \text{ kilometer}}\right)$

B. $\left(\frac{15 \text{ meters}}{1 \text{ second}}\right)\left(\frac{1 \text{ minute}}{60 \text{ seconds}}\right)\left(\frac{1 \text{ hour}}{60 \text{ minutes}}\right)\left(\frac{1 \text{ kilometer}}{1000 \text{ meters}}\right)$

C. $\left(\frac{15 \text{ meters}}{1 \text{ second}}\right)\left(\frac{60 \text{ seconds}}{1 \text{ minute}}\right)\left(\frac{60 \text{ minutes}}{1 \text{ hour}}\right)\left(\frac{1 \text{ kilometer}}{1000 \text{ meters}}\right)$

D. $\left(\frac{15 \text{ meters}}{1 \text{ second}}\right)\left(\frac{1 \text{ minute}}{60 \text{ seconds}}\right)\left(\frac{60 \text{ minutes}}{1 \text{ hour}}\right)\left(\frac{1 \text{ kilometer}}{1000 \text{ meters}}\right)$

11. The table below shows the amount of time it took three runners to run different distances.

Runner	Distance	Time
Jamal	6,160 yards	1 hour 5 minutes
Monica	13,200 feet	30 minutes
Travis	4 miles	45 minutes

Which choice lists the runner's speeds in order from least to greatest?

(Note: 1 mile = 5,280 feet)

A. Monica, Travis, Jamal
B. Monica, Jamal, Travis
C. Jamal, Monica, Travis
D. Jamal, Travis, Monica

12. **A car is traveling 50 miles per hour. What is this rate of speed in feet per minute?**

A. 3,000
B. 4,400
C. 6,336
D. 8,333

13. In the equation $F = k\frac{m_1 m_2}{r^2}$, force (F) is defined in $\frac{kg \cdot m}{s^2}$, mass $(m_1$ and $m_2)$ is defined in kg, and distance (r) is defined in meters (m). What are the units of the proportionality constant, k?

A. $m^{-2}s^2$

B. m^2s^{-2}

C. $m^{-3}kg^1s^2$

D. $m^3kg^{-1}s^{-2}$

14. Mr. Carter is creating a concrete path in his backyard. The path will be 72 yards long, 2 feet wide, and 6 inches thick. The cost of the concrete is $75 per cubic yard. How much will the concrete cost for Mr. Carter to create the path?

A. $1,244

B. $864

C. $648

D. $600

15. **Shirley purchased a new refrigerator for her home. Which measurement best describes the storage capacity of a refrigerator?**

A. 50 cubic feet

B. 50 cubic yards

C. 50 cubic meters

D. 50 cubic centimeters

16. Dwight's car can accelerate from 0 to 65 miles/hour in 4.5 seconds. What is the car's acceleration in feet/square second?

(One mile = 5,280 feet)

A. 14.4

B. 21.2

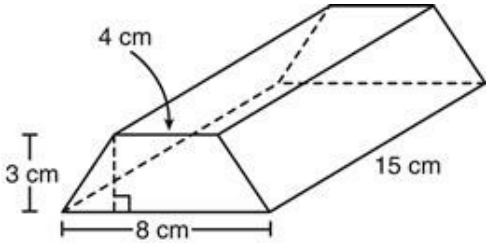
C. 95.3

D. 1,271.1

17. **Ms. Glick drew two line segments on the chalkboard. The first line segment was 168 cm long and the other was 5 feet 2 inches long. If 1 inch = 2.54 cm, approximately how many inches longer was the first line segment than the second?**

A. 1 inch
B. 4 inches
C. 8 inches
D. 11 inches

18. **What are the appropriate units of measurement for finding the volume of the figure below?**



A. millimeters
B. centimeters
C. cubic centimeters
D. square centimeters

19. Rob works 5 days per week, 8 hours per day, and 50 weeks per year. He earns $53,000 per year. How much does Rob earn per hour?

A. $21.50
B. $25.48
C. $26.50
D. $37.74

20. **A blue whale calf swam from Miami, Florida, to Havana, Cuba, a distance of 228 miles, in 12 hours 22 minutes. Which is closest to the calf's average rate of speed, in feet per hour?**

A. 1,106
B. 4,204
C. 32,448
D. 97,346

21. A cheetah can run at a speed of 75 miles per hour and can sustain that speed for about 1,500 feet. ***Approximately*** how fast is the cheetah running in feet per second? (Note: 1 mile = 5,280 feet)

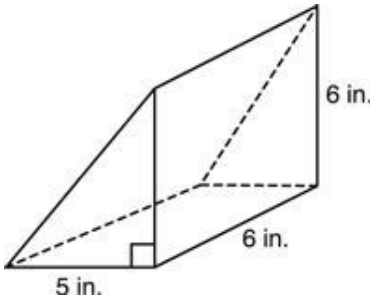
A. 20 feet per second

B. 30 feet per second

C. 70 feet per second

D. 110 feet per second

22. **What are the appropriate units of measurement for finding the surface area of the figure below?**



A. inches

B. half-inches

C. cubic inches

D. square inches

23. Jake's bedroom is the shape of a rectangular prism. The length of his bedroom is 12 ft, the width is 192 in., and the height is 3 yards. What is the volume of his bedroom?

A. $6{,}912\ \text{in.}^3$

B. $6{,}912\ \text{ft}^3$

C. $1{,}728\ \text{in.}^3$

D. $1{,}728\ \text{ft}^3$

24. Theo competed in the 500 meter speed skating event at a competition. His average speed for the event was 45.6 kilometers per hour. The World Record for the event was 32.9 miles per hour. How many kilometers per hour less was Theo's average speed than the World Record? (Note: 1 mile ≈ 1.6 kilometers)

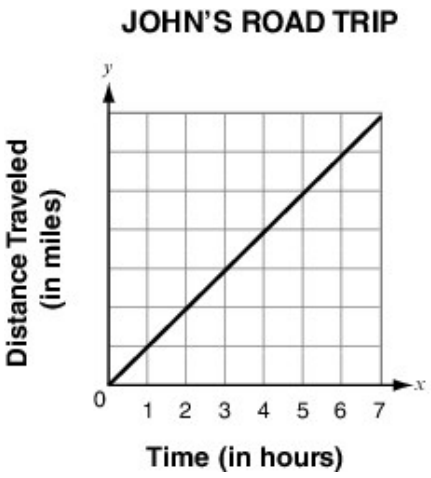
A. 4 kilometers per hour

B. 7 kilometers per hour

C. 13 kilometers per hour

D. 25 kilometers per hour

25. John and his friends drove 483 miles from Miami to Tallahassee. The time they took to cover the distance is shown in the graph below.



What is the **best** scale for the y-axis?

A. 1 unit = 1 mile

B. 1 unit = 10 miles

C. 1 unit = 70 miles

D. 1 unit = 483 miles

26. **Dean purchased a box of cereal. Which of these measurements best describes the volume of the box?**

A. 154 cubic feet

B. 154 cubic inches

C. 154 cubic meters

D. 154 cubic millimeters

27. The maximum speed for a roller coaster is about 3,080 feet per minute. What is the maximum speed of the roller coaster in miles per hour (mph)?
(Note: 1 mile = 5,280 feet)

A. 35 mph

B. 40 mph

C. 55 mph

D. 60 mph

28. **Emily found that the circumference of a volleyball is between 65 and 67 centimeters. If Emily were to find the volume of the volleyball, which of the following units should she use to express this volume?**

A. inches
B. centimeters
C. cubic centimeters
D. square centimeters

29. John leaves his house for the local community center. He walks a distance of 3 miles from his house in 45 minutes before stopping at a store to pick up a bottle of water. From there, he walks to the community center, which is 5 miles away from the store, in 1 hour. What is John's approximate average speed, **in miles per minute,** for the entire time he is walking?

A. 0.067

B. 0.076

C. 0.083

D. 0.150

30. Jose rode his bike 326 inches in 1 second. ***About*** how fast was Jose riding his bike? (Note: 1 mile = 5,280 feet)

A. 0.3 miles per hour

B. 3.7 miles per hour

C. 18.5 miles per hour

D. 27.2 miles per hour

31. **Joe plans to install a concrete driveway in front of his house. Which of these measurements best describes the volume of concrete in one truck load?**

A. 8 cubic feet
B. 8 cubic yards
C. 8 cubic kilometers
D. 8 cubic centimeters

32. Jon is traveling at a speed of 30 miles per hour. ***Approximately*** how many minutes will it take him to travel 16 kilometers?
(Note 1 mile ≈ 1.6 kilometers)

A. 20 minutes
B. 23 minutes
C. 30 minutes
D. 33 minutes

33. The equation $KE = \frac{1}{2}mv^2$ can be used to determine the kinetic energy of an object, where m is the mass, in kilograms, and v is the velocity, in meters per second. What are the units of kinetic energy?

A. $\frac{kg \cdot m^2}{s}$
B. $\frac{kg \cdot m^2}{s^2}$
C. $\frac{kg \cdot s^2}{m}$
D. $\frac{kg \cdot s^2}{m^2}$

34. A car has a mass of *x* kilograms (*kg*) and an acceleration of *y* meters per second squared $\left(\frac{m}{s^2}\right)$. If $\text{acceleration} = \frac{\text{force}}{\text{mass}}$, which unit would represent the force of the car?

A. $\frac{m}{s^2}$

B. $\frac{kg(m)}{s^2}$

C. $\frac{kg}{s^2}$

D. $\frac{m}{kg(s^2)}$

35. Katie ran 3 miles in 30 minutes. What was Katie's average speed in feet per second? (Note: 1 mile = 5,280 feet)

A. 4.1 feet per second

B. 8.8 feet per second

C. 528 feet per second

D. 31,680 feet per second

36. Aaron is painting four walls. Each wall has a surface area of 9 square yards. He will buy cans of paint that cover 100 square feet. What is the fewest number of cans of paint that Aaron needs to buy?

A. 3

B. 4

C. 5

D. 6

37. **Which length would appropriately be measured in millimeters?**

A. the length of a cat's tail

B. the diameter of the head of a nail

C. the height of a wall in a house

D. the distance around a high school track

38. Christina ran 12 feet in 3 seconds. What was Christina's ***approximate*** speed in miles per hour? (Note: 1 mile = 5,280 feet)

A. 8.2 mph

B. 5.9 mph

C. 2.7 mph

D. 0.2 mph

39. A jet engine's power is measured in $\frac{kg \cdot m^2}{s^3}$. Power is defined to be thrust times speed. If speed is measured in meters per second, then which of these represents how thrust is measured?

A. kg

B. $\frac{kg \cdot m}{s^2}$

C. $\frac{kg \cdot m^2}{s^2}$

D. $\frac{kg \cdot m^3}{s^4}$

40. **Heather finds the diameter of a silver dollar to be 1.04 inches, which is equivalent to 26.5 millimeters. She also finds the area of the bottom surface of the coin. Which of the following units should Heather use?**

A. square millimeters
B. cubic inches
C. millimeters
D. inches

41. **A total of 920 widgets are being packed and shipped in boxes that hold a maximum of 7 kilograms each. Each widget has a mass of 70 grams. What is the minimum number of boxes needed to pack and ship the entire order of widgets?**

A. 8
B. 9
C. 10
D. 14

42. Pressure is defined as force divided by the area on which the force is acting. The force is measured in Newtons (N), which has units of $\frac{kg \cdot m}{s^2}$.

What is the pressure produced by a force of 300 N acting on a area of $30\ m^2$?

A. $10\ \frac{kg}{m \cdot s^2}$

B. $10\ \frac{kg \cdot m}{s^2}$

C. $9{,}000\ \frac{kg \cdot m}{s^2}$

D. $9{,}000\ \frac{kg \cdot m^3}{s^2}$

43. The space shuttle accelerated to a speed of 18,000 miles per hour immediately after launch. How many feet per second was the space shuttle traveling? (Note: 1 mile = 5,280 feet)

A. 1,584,000 feet per second

B. 26,400 feet per second

C. 18,100 feet per second

D. 300 feet per second

44. **It takes 6 gallons of water to fill a cooler. A leak developed in the bottom of the cooler when it was full, and 10 hours later it was empty. At what average rate in ounces per hour did the water leak from the cooler?**

A. 0.6
B. 12.8
C. 21.3
D. 76.8

45. **A faucet is dripping at a rate of 12 milliliters per minute. Which rate in liters per hour is closest to the dripping rate of the faucet?**

A. 0.20 liter per hour
B. 0.72 liter per hour
C. 1.39 liters per hour
D. 7.20 liters per hour

46. Joseph is driving a car. Traveling at an average speed, he can cover distance d (in meters) in time t seconds, which is given by the equation $d = 35t$. Which equation represents the distance d' (in kilometers) covered in time t' (in hours) if he is driving at the same average speed?

A. $d' = 2.1t'$

B. $d' = 9.72t'$

C. $d' = 35t'$

D. $d' = 126t'$

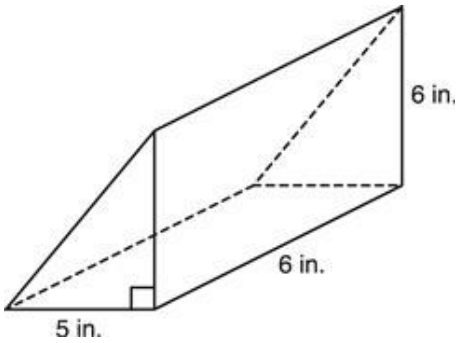
47. **The park in Springtown has a 2.13 km hiking trail. How many miles long is the hiking trail?**

A. 1.32 miles
B. 3.41 miles
C. 13.31 miles
D. 34.08 miles

48. **Laura has 2 jars full of coins. The jars are both 12 inches tall, or 30.48 centimeters, and have a diameter of 6 inches, or 15.24 centimeters. If Laura finds the volume of the two containers, which of the following units of measurement should she use?**

A. inches
B. centimeters
C. cubic inches
D. square centimeters

49. **What are the units of measurement for finding the volume of the figure below?**



A. inches
B. half-inches
C. cubic inches
D. square inches

50. **A small airplane is flying at a speed of 15,840 feet per minute. What is the airplane's speed in miles per hour?**

A. 158 mph
B. 180 mph
C. 264 mph
D. 1320 mph

51. **There are 1,000,000 microseconds in a second. If the length of a day on a planet increases by 1,250 microseconds each year, by how much time, in seconds, will the length of a day on this planet increase in 25 centuries?**

A. 5.0 seconds
B. 3.125 seconds
C. 0.500 seconds
D. 0.3125 seconds

52. **Matthew finds the diameter of a half-dollar to be 30.61 mm in length. If Matthew wants to find the area of the top surface of the half-dollar, what are the appropriate units for his answer?**

A. millimeters
B. centimeters
C. cubic millimeters
D. square millimeters

53. **Which unit of measure would be most appropriate to use when finding the weight of an orange?**

A. kiloliters
B. meters
C. ounces
D. tons

54. Heather averages 24 miles per gallon of gas when driving to work. Gas costs $3.36 per gallon. James uses $0.17 worth of gas per mile driving his truck. Which statement describes the cost of gas per mile driven by James and by Heather?

A. James pays $0.03 more per mile than Heather.
B. Heather pays $0.03 more per mile than James.
C. James pays $0.07 more per mile than Heather.
D. Heather pays $0.07 more per mile than James.

55. Erin is planning the remainder of a week-long bike ride.

- The entire distance she will travel is 260 miles.
- She rode her bicycle at a rate of 13 mph a total of 9 hours by the end of the third day.

At this rate, what is a reasonable estimate for the number of hours Erin will ride her bicycle for the remaining distance?

A. 7 hours

B. 11 hours

C. 20 hours

D. 29 hours

56. **What unit would be most appropriate for measuring the mass of an elephant?**

A. gallons
B. kilograms
C. milligrams
D. pounds

57. A tire on a car has a circumference of 78.5 inches. If a tire spins at 500 revolutions per minute, ***approximately*** how many miles will the car travel in 1 hour? (Note: 1 mile = 5,280 feet)

A. 7 miles

B. 32 miles

C. 37 miles

D. 68 miles

58. **Which unit would be most appropriate to use to express the rate of speed of the blades on a ceiling fan?**

A. feet per second
B. inches per minute
C. miles per hour
D. revolutions per minute

59. A recipe for cookies needs 6 tablespoons of butter per batch. Logan is making 6 batches of cookies for a bake sale. How much butter will Logan need? (Note: 4 tablespoons = $\frac{1}{4}$ cup)

A. 2 cups plus 4 tablespoons

B. 2 cups plus 8 tablespoons

C. 9 tablespoons

D. 36 cups

60. **Which unit is most appropriate to use to measure the volume of a bathtub?**

A. cubic feet

B. cubic miles

C. cubic millimeters

D. cubic centimeters

61. **Luis purchased 50,000 square tiles that are 4 inches long to put on his floors. The sealant Luis needs to use on the tiles will seal 1000 square feet per gallon. How many gallons of the sealant does Luis need to buy?**

A. 4

B. 6

C. 13

D. 50

62. Alex needs to buy 11 yards of fabric. A store sells fabric by the meter. ***Approximately*** how many meters of fabric does Alex need to buy? (Note: 1 inch ≈ 2.54 cm)

A. 10 m

B. 9 m

C. 8 m

D. 4 m

63. Roger and Nolan each threw a baseball. Roger threw the ball at a speed of 55 miles per hour. Nolan threw the ball at a speed of 85 kilometers per hour. Which statement is true? (Note: 1 mile ≈ 1.6 kilometers)

A. Roger threw the ball about 2 miles per hour faster than Nolan.

B. Roger threw the ball about 2 kilometers per hour faster than Nolan.

C. Nolan threw the ball about 2 miles per hour faster than Roger.

D. Nolan threw the ball about 2 kilometers per hour faster than Roger.

64. A piece of an iceberg with a mass of 37 kg falls from an altitude of 25.8 m. Its potential energy is determined by mass times acceleration times height. If the acceleration due to the gravity on Earth is $9.8\frac{m}{s^2}$, what are the units of potential energy?

A. $\frac{kg \cdot s^2}{m^2}$

B. $\frac{kg \cdot s^2}{m}$

C. $\frac{kg \cdot m}{s^2}$

D. $\frac{kg \cdot m^2}{s^2}$

65. Marsha's pool is leaking 12 gallons of water per day. How many quarts per hour is the pool leaking?

A. 0.5

B. 2

C. 24

D. 48