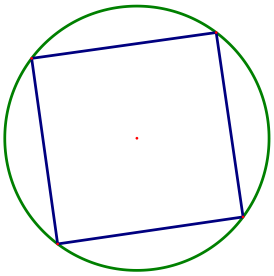
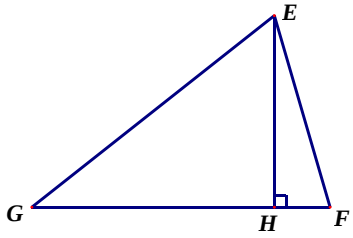
2016 8th Grade Test

1. Which of the following is the greatest?
   A. 1^{888}
   B. 2^{777}
   C. 3^{666}
   D. 4^{555}
   E. 6^{444}
2. How many whole numbers between 1 and 100,000 end with the digits 123?
   A. 50
   B. 76
   C. 99
   D. 100
   E. 101
3. If the area of the square below is 256 square meters, what is the circumference of the circle?



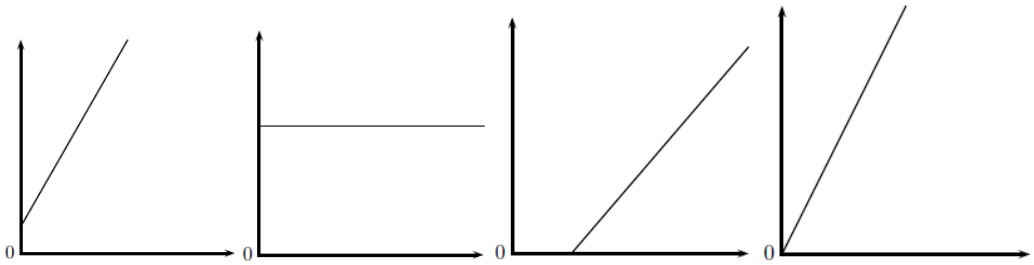
   A. 128 m
   B. 16π m
   C. 128π m
   D. $\sqrt{512}\pi$ m
   E. 512 m
4. In Triangle EFG below, $\overline{EG} = 8.36$ cm, $\overline{EF} = 5.4$ cm, and $\overline{HG} = 6.56$ cm. What is the approximate area of Triangle EFG?



   A. 10.98 cm^2
   B. 15.68 cm^2
   C. 20.93 cm^2
   D. 39.64 cm^2
   E. 41.88 cm^2

5. A fair coin has landed tails up seven times in a row. What is likely to happen on the 8th flip?
   A. It is more likely to land on heads.
   B. It is more likely to land on tails.
   C. It must land on heads.
   D. It must land on tails.
   E. It is equally likely to land on heads or tails.
6. What digit will be in the ten-billionths place of the decimal representation of $\frac{3}{7}$?
   A. 1
   B. 2
   C. 5
   D. 6
   E. 8
7. A party planner is showing Jaime options to serve at his next party. There are three choices of appetizers, four choices of main dishes, and two desserts. If any combination is possible, how many different combinations does Jamie have from which to choose?
   A. 9
   B. 12
   C. 16
   D. 20
   E. 24
8. In a drawer full of socks, if two socks are pulled at random, the probability of getting a match is 14%. What is the probability that the socks will not match?
   A. 7%
   B. 14%
   C. 28%
   D. 86%
   E. 96%
9. A spherical water balloon with a diameter of 8 inches is filled with water. It is leaking into a cone than has a height of 12 inches. To the nearest hundredth, what must the radius of the base of the cone be so that the water in the balloon fills the cone, but does not overflow?
   A. 2.78 inches
   B. 4.62 inches
   C. 5.87 inches
   D. 14.82 inches
   E. 21.33 inches

10. Which of the following graphs represent a proportion?



A B C D

A. A
B. B
C. C
D. D
E. All of the above

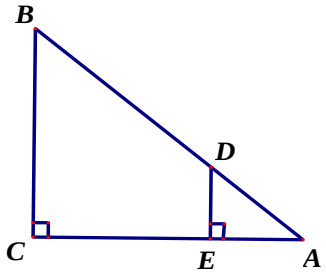
11. How many solutions will the following system of equations have if a and b are constants and $a \neq b$?

$$y = \frac{2}{3}x + a$$
$$3y - 3b = 2x$$

A. 0
B. 1
C. 2
D. 3
E. Infinitely Many Solutions

12. What is the approximate length of the hypotenuse of the Triangle ABC?

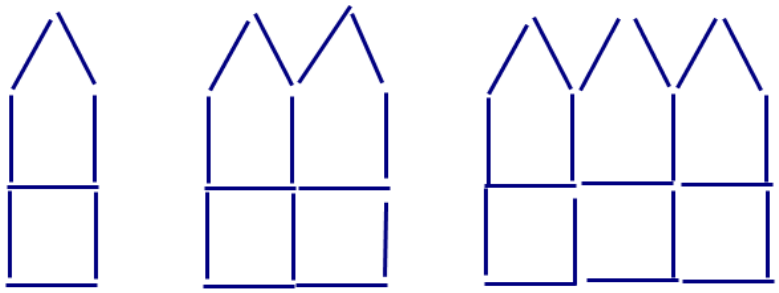
AE = 2.09 cm
EC = 4.00 cm
ED = 1.72 cm



A. 6.92 cm
B. 7.89 cm
C. 8.02 cm
D. 9.10 cm
E. 9.63 cm

13. Your school's student council held a dance after a basketball game. Tickets were $2 each for students and $3 each for nonstudents. You know that there were exactly 6 nonstudents at the last dance and that, overall, the Student Council made $148. How many students, not including nonstudents, attended the dance?
    A. 42
    B. 45
    C. 65
    D. 71
    E. 83

14. The houses in the pattern below are made from toothpicks. How many toothpicks would it take to build House 60?



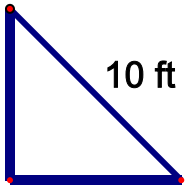
House 1
8 TP

House 2
14 TP

House 3
20 TP

    A. 340
    B. 354
    C. 360
    D. 362
    E. 368

15. The triangle below is an isosceles right triangle. Determine its area.



    A. 25 square feet
    B. $\sqrt{50}$ square feet
    C. 50 square feet
    D. 100 square feet
    E. 225 square feet

16. Which of the following is equivalent to $(xy)^{-4}$?

A. x^4y^4

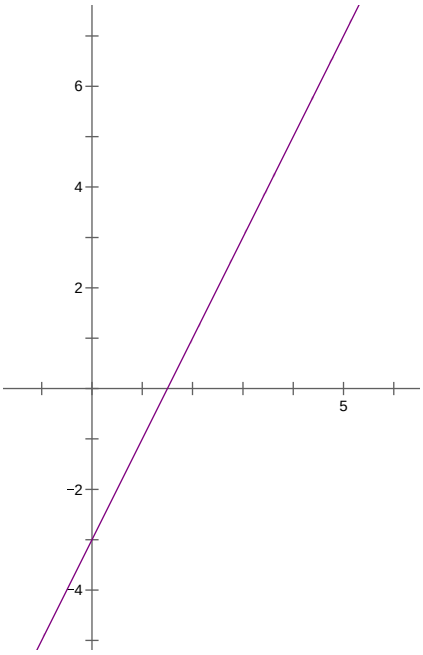
B. $-(xy)^4$

C. $\frac{x^4}{y^4}$

D. $\frac{1}{4(xy)}$

E. $\frac{1}{x^4y^4}$

17. The graph of $y = 2x - 3$ is shown below. What would be the equation of the graph of $y = 2x - 3$ translated 3 units left?



A. $y = 2x$

B. $y = 2x - 6$

C. $y = 2x + 2$

D. $y = 2x + 3$

E. $y = -1x - 3$

18. What is the sum of all the odd integers from 0 to 200?

A. 10,000

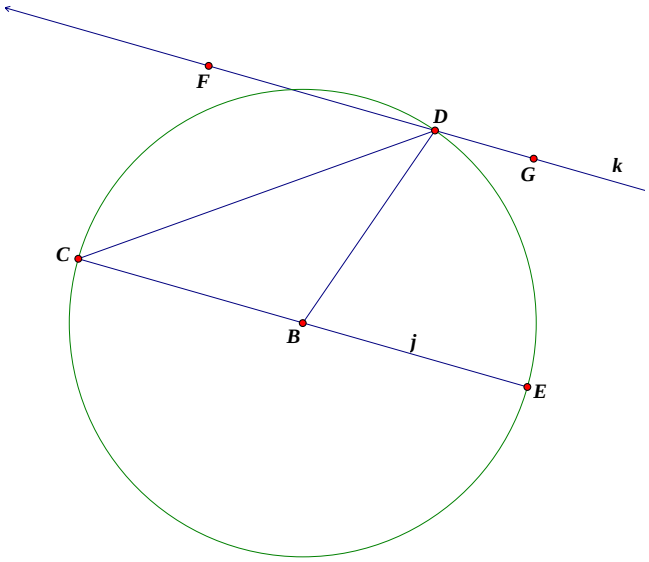
B. 15,060

C. 20,000

D. 40,000

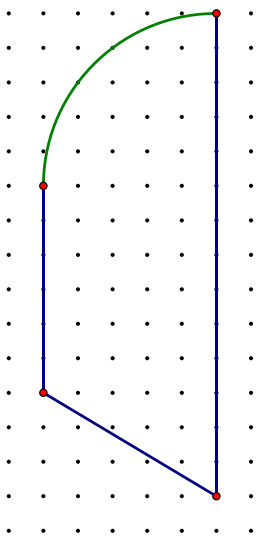
E. 56,000

19. Angle DCB measures 31 degrees. B is the center of the circle and lines k and j are parallel. Find the measure of angle GDB.



A. 62°
B. 87°
C. 110°
D. 118°
E. 149°

20. Determine the approximate perimeter of the figure below, assuming the distance between two adjacent horizontal dots is 1 unit.



A. 33.7 units
B. 34.1 units
C. 38.7 units
D. 43.7 units
E. 60.1 units

21. How many of the following statements are always true?

Every square is a quadrilateral.
Every square is a rectangle.
Every trapezoid has two congruent sides.
The interior angles of a hexagon are always congruent.
The opposite angles of a parallelogram are always congruent.
The diagonals of a rectangle are always perpendicular.

A. 1
B. 2
C. 3
D. 4
E. 5

22. John is participating in a triathlon. He swims at a rate of 2 mph and runs at a rate of 6 mph. The course is broken down in the following manner: Leg 1- Swim 6 miles, Leg 2- Run 15 miles, and Leg 3- Bike 18 miles. How fast will John have to bike to finish the triathlon in exactly 7 hours?
A. 6 mph
B. 9 mph
C. 12 mph
D. 18 mph
E. 27 mph

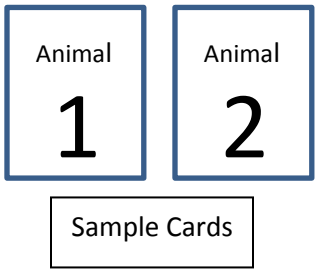
23. A box shaped like a cube can hold 1000 cubic millimeters. What is the approximate volume of the largest spherical ball that will fit completely inside the box?
A. 314.4 mm^3
B. 498.7 mm^3
C. 523.6 mm^3
D. 538.8 mm^3
E. 712.9 mm^3

24. A certain cone has a surface area of 341 square decimeters. What is its surface area in square decameters?
A. 0.00341
B. 0.0341
C. 3.41
D. 34,100
E. 3,410,000

25. A convex hexagon has five interior angles with the following measures: 100°, 120°, 80°, 150°, and 120°. The measure of the final interior angle is missing. What is the measure of the last interior angle?
    A. 100°
    B. 120°
    C. 150°
    D. 160°
    E. 175°

26. In Neverland, a card deck consists of the following 12 cards:

    1 of Animal, 2 of Animal, 3 of Animal, 4 of Animal,
    1 of Plant, 2 of Plant, 3 of Plant, 4 of Plant,
    1 of Mineral, 2 of Mineral, 3 of Mineral, 4 of Mineral



Sample Cards

    If 2 cards are randomly chosen for a card hand, what is the probability that both cards will have different numbers?
    A. 2/3
    B. 3/4
    C. 5/132
    D. 9/11
    E. 7/12

27. Suppose the population of Somewhere starts at 1000 and increases by 2% each year, and the population of Anyplace starts at 800 and increases by 3% each year. How many years will it take for the population of Anyplace to exceed the population of Somewhere?
    A. 18 years
    B. 23 years
    C. 25 years
    D. 28 years
    E. 50 years

28. Below are 4 sets of numbers. In which set(s) are all the numbers rational numbers?
    Set 1: $\{1, -1, 0\}$
    Set 2: $\left\{\frac{1}{2}, \frac{-1}{2}, \frac{\pi}{2}\right\}$
    Set 3: $\{0.\bar{3}, 0.5\}$
    Set 4: $\left\{.\overline{12}, -.5, \frac{17}{4}\right\}$
    A. Set 2 only
    B. Sets 3 and 4 only
    C. Sets 1,2, and 4 only
    D. Sets 1,3 and 4 only
    E. Sets 2,3, and 4 only

29. What is the x-coordinate of the point of intersection of the line through the points (0,3) and (4,7) with the line through the points (2,5) and (6,13)?
    A. 0
    B. 2
    C. 3
    D. 4
    E. 6
30. Suppose a, b, and c are non-zero real numbers and a > b and b > c.
    Which of the following statements MUST be true?

    Statement 1: $a/c > 1$
    Statement 2: $a - b > c$
    Statement 3: $a/c > b/c$
    Statement 4: $a - c > a - b$

    A. Statement 2 only
    B. Statement 4 only
    C. Statement 1 and 4 only
    D. Statement 2 and 3 only
    E. None of the statements must be true