1. If two sides of a triangle have lengths of 3 feet and 4 feet, then what must be true about the length of the third side?

    a. It must be 5 feet.
    b. It must be 7 feet.
    c. It must be less than 7 feet.
    d. It must be more than 7 feet.
    e. It can be any length.

2. The decimal equivalent of $\frac{1}{7}$ is a non-terminating repeating decimal. What digit is in the 10^{-20} place value position of its decimal equivalent?

    a. 4
    b. 2
    c. 8
    d. 5
    e. 7

3. You are going to toss a penny five times. What is the probability that the first head will occur on the third toss?

    a. $\frac{1}{8}$
    b. $\frac{1}{3}$
    c. $\frac{1}{2}$
    d. $\frac{1}{4}$
    e. $\frac{3}{5}$

4. Five machines can produce 12 gallons of Glorious Goo in 10 days. How many days would it take 4 machines to produce 48 gallons?

    a. 120 days
    b. 96 days
    c. 60 days
    d. 50 days
    e. 40 days

5. What is the area of the trapezoid with bases $\overline{AB}$ and $\overline{DC}$ shown here if the measure of angle B is 30°?

D   4 cm   C

3 cm

A   5 cm   B
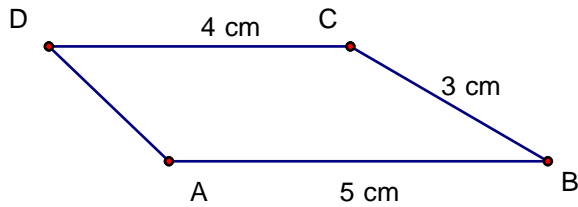
  a.   30 square centimeters
  b.   15 square centimeters
  c.   13.5 square centimeters
  d.   6.25 square centimeters
  e.   6.75 square centimeters

6. If $x + y = 8$ and $x + z = 12$, which statement must be true?

  a. $x + y + z = 20$
  b. $y > z$
  c. $y < x < z$
  d. $12 - z = 8 - y$
  e. $x + y = x + z + 4$

7. Which number in this list is greatest? $\left(\dfrac{2}{3}\right)^{100}, \left(\dfrac{1}{3}\right)^{100}, \left(\dfrac{2}{3}\right)^{50}, \left(\dfrac{1}{3}\right)^{50}, \left(\dfrac{2}{3}\right)^{20}$

  a. $\left(\dfrac{2}{3}\right)^{100}$

  b. $\left(\dfrac{1}{3}\right)^{100}$

  c. $\left(\dfrac{2}{3}\right)^{50}$

  d. $\left(\dfrac{1}{3}\right)^{50}$

  e. $\left(\dfrac{2}{3}\right)^{20}$

| X	Y1
0	-3
1	-1
3	3
5	7

8. Which of the following graphs corresponds to the table shown here?

a.

b.

c.

d.

e.
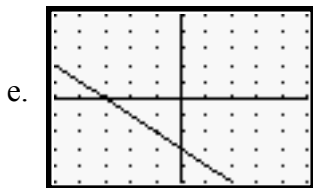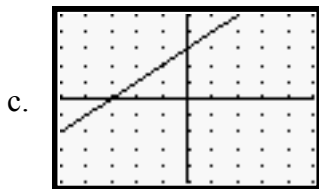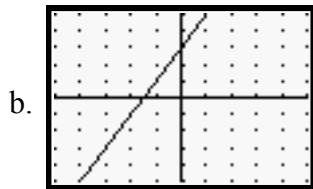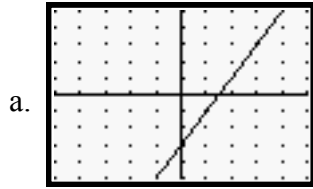
9. There are 5 ten-dollar bills, 4 twenty-dollar bills, and 1 fifty-dollar bills in a bag. Without looking, you may reach in and pull out two bills that you get to keep. What is the probability the total amount of money you draw is greater than $20?

a. $\dfrac{2}{9}$

b. 0.2

c. 0.5

d. 0.4

e. $\dfrac{7}{9}$

10. Four circles are arranged as shown. Each has a radius of 3 cm. Their centers are the vertices of a square. The area of the shaded region is closest to which of the following?
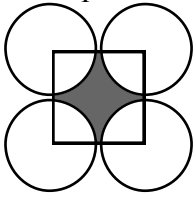
    a. 7.7 square centimeters
    b. 12.1 square centimeters
    c. 17.2 square centimeters
    d. 18 square centimeters
    e. 27 square centimeters

11. In base five, the first ten counting numbers are 1, 2, 3, 4, 10, 11, 12, 13, 14, 20. What base ten number would correspond to 11112 in base 5?

    a. 22
    b. 52
    c. 252
    d. 782
    e. 1222

12. A section of a number line is shown below. What integer corresponds to X (assuming the integers are evenly spaced along the number line)?

-158   X   -148
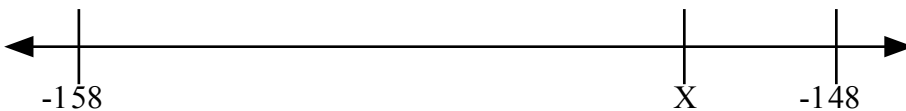
    a. −146
    b. −150
    c. −153
    d. −149
    e. −156

13. $(2.3 \times 10^8) \div (9.2 \times 10^{12})$ is equal to which of the following?

    a. 4×10^{-4}
    b. −12.5
    c. 0.000025
    d. 0.0000025
    e. 2.5× ̄5

14. In the isosceles trapezoid shown below the measure of angle CAD is 14° and the measure of angle ABC is 22°. What is the measure of angle ACD?
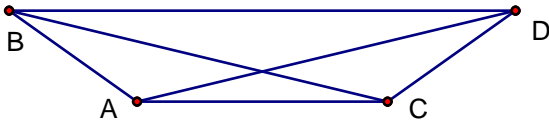
  a. 152°
  b. 144°
  c. 122°
  d. 114°
  e. 104°

15. A cubic centimeter is what percent of a cubic meter?

  a. 1%
  b. 0.1%
  c. 0.01%
  d. 0.001%
  e. 0.0001%

16. Pat has $50 saved. She plans to add $2.50 to that each week. Bill has $30 saved. He plans to add $5 to that each week. If neither spends any money, in how many weeks will Bill have twice as much as Pat?

  a. 8 weeks
  b. 10 weeks
  c. 34 weeks
  d. 50 weeks
  e. It will never happen.

17. Three squares are placed side-by-side to form a large rectangle as shown here.
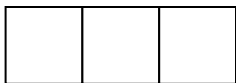
The perimeter of the large rectangle is 64 centimeters. What is the area of one of the squares?

  a. 32 centimeters
  b. 32 square centimeters
  c. 64 square centimeters
  d. 72 square centimeters
  e. 192 square centimeters

18. A 4-square train is made with 13 toothpicks as shown here:

A train is made with 400 toothpicks. How many squares are in the train?

a. 400 squares
b. 300 squares
c. 133 squares
d. 130 squares
e. 100 squares

19. One ox eats the same amount as 15 sheep. Two people rent a field for $175. Person A puts 3 oxen in the field. Person B puts 30 sheep in the field. What should each person's part of the rent be, based on the amount of grass the animals eat?

a. Person A should pay $100 and Person B should pay $75.
b. Person A should pay $105 and Person B should pay $70.
c. Person A should pay $90 and Person B should pay $85.
d. Person A should pay $92.50 and Person B should pay $82.50.
e. Person A should pay $87.50 and Person B should pay $87.50

20. An ogre, a troll, and a goblin are going to divide 8 pieces of gold. They cannot break any piece of gold. Everyone must get at least one gold piece. No two can have the same number of gold pieces. In how many different ways can they divide the gold?

a. 56 ways
b. 42 ways
c. 36 ways
d. 24 ways
e. 12 ways

21. On a map 2.5 inches represents 30 miles. On the map it is 8 inches from Atown to Bville. How many miles apart are the two towns?

a. 9.6 miles
b. 96 miles
c. 144 miles
d. 240 miles
e. 120 miles

22. At a basketball game, Jerdan scored a total of 33 points on 10 field goals (worth either 2 or 3 points) and 7 free throws (worth 1 point each). How many of the field goals were worth 3 points?

   a. 8
   b. 7
   c. 6
   d. 5
   e. 4

23. A fly lands on a football field and starts to walk. It walks 6 yards due east. Then it turns and walks 8 yards due south. Next it walks 3 yards due west. Finally it goes due south again for 5 yards. How far is the fly from the point where it landed?

   a. $\sqrt{205}$ yards
   b. 15 yards
   c. 13 yards
   d. $\sqrt{178}$ yards
   e. $\sqrt{392}$ yards

24. A factory makes three-legged stools and four-legged stools. They use the same kind of seats and legs for each. The only difference is the number of holes they bore in the seats for the legs. The company has 161 seats and 566 legs. If they want to use all their parts with no leftovers, how many three-legged stools should they make?

   a. 83
   b. 78
   c. 81
   d. 80
   e. 73

25. The average weight of 10 children is 88 pounds. Two more children join the group: one weighs 95 pounds and the other 93 pounds. What is the average weight for the twelve children?

   a. 89 pounds
   b. 90 pounds
   c. 91 pounds
   d. 92 pounds
   e. 93 pounds

26. The length of a rectangle is increased by 25% and the width of the rectangle is increased by 40%. By what percent is the area of the rectangle increased?

    a. 100%
    b. 75%
    c. 65%
    d. 60%
    e. 10%

27. Define a new operation $A*B = (A + B) \cdot B$. For example, $2 * 3 = 15$. Evaluate $(3*5)*7$.

    a. 105
    b. 275
    c. 280
    d. 329
    e. 357

28. The Beanton Marathon is 26 miles long. The officials want to set up water stations equally spaced along the way between the starting line and the finish line. There will also be one at the starting line, one at the finish line and seven between. How far apart should the water stations be? (Round to the nearest hundredth.)

    a. 3.71 miles
    b. 3.42 miles
    c. 3.25 miles
    d. 3.06 miles
    e. 2.89 miles

29. The points (6, 8) and (-2, 2) are endpoints of a diameter of a circle with radius of 5. What are the coordinates of its center?

    a. (1, 3)
    b. (3, 7)
    c. (2, 5)
    d. (3, 4)
    e. (2.5, 3.4)

30. Three eighths of the seats in a theatre are filled. One sixth of the people seated in the theater are men. There are 125 women seated in the theater. How many people can the theater seat?

    a. 400 people
    b. 750 people
    c. 800 people
    d. 1000 people
    e. 2000 people