MATH COMPETITION

April 6, 2019
■ RIT Competition ■
Sprint Round
Problems 1 - 30

Name _____

DO NOT BEGIN UNTIL YOU ARE INSTRUCTED TO DO SO.

This section of the competition consists of 30 problems. You will have 40 minutes to complete all the problems. You are allowed to use a basic calculator. You are not allowed to use books or other aids during this round. Calculations may be done on scratch paper. All answers must be complete and legible. If the answer is expressed in common fraction, reduce the fraction to lowest terms. Record your final answer in the designated space on the problem sheet. The required unit for the answer is included. If you complete the problems before time is called, use the time remaining to check your answers.

| Total Correct	Scorer's Initials

1. There are 1,600 bookshelves in RIT's Wallace Library with exactly 250 books on each shelf. How many total books are on the shelves in the library?

1. _____

2. Given $a = 2.34$, $b = 1.234$, and $c = 3.4$, evaluate the expression $(a - b) \div c$. Round your answer to the nearest tenth.

2. _____

3. On Wednesday, 64 of the 80 teachers at Baird Middle School were present. What percent of the teachers were absent?

3. _____ %

4. How many seconds are in 1.8 minutes?

4. _____ sec

5. The point R(1, 6) is translated 5 units right and 3 units down. What are the coordinates (x, y) of the resulting point, R'?
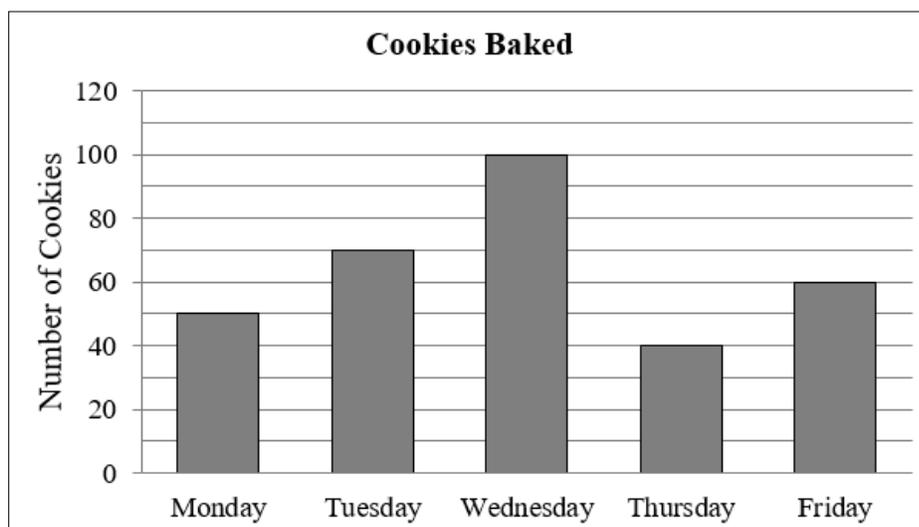
5. _____
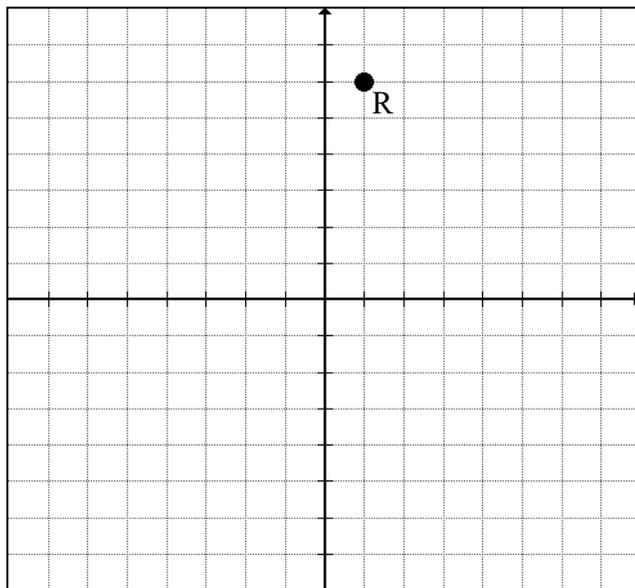
6. What percent of 22 is 33?

6. _____ %

7. Zane baked cookies each day for a bake sale. How many cookies in total did Zane bake on Tuesday and Thursday?
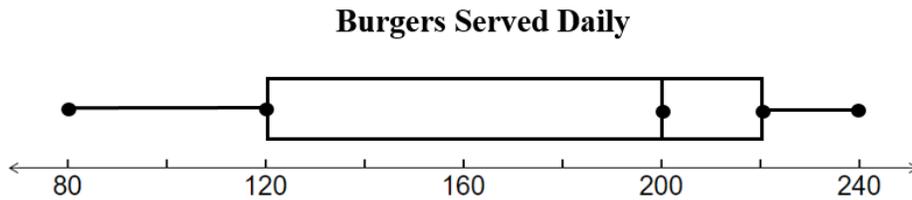
7. _____

Cookies Baked

8. N is $\frac{N}{12}$ between $\frac{1}{3}$ and $\frac{1}{2}$. What is the value of N?

8. _____

9. Mr. Randolph owns a number of burger restaurants, and he compared how many burgers the restaurants served each day. The box-and-whisker plot shows the results. What percent of the burger restaurants serve 120 or more burgers?

9. _____ %

Burgers Served Daily

80	120	160	200	240

10. Evaluate the following sum: 1,234 + 2,345 + 3,456. Now add together the four digits of that sum. What is the result?

10. _____

11. Each bounce of a ball goes $\frac{3}{4}$ as high as the previous bounce. The second bounce was 24 inches high. What was the height, in inches, of the first bounce?

11. _____ in

12. Wilma went to the store. She bought 2½ pounds of double chocolate cookie dough. How much did she spend?

12. $ _____

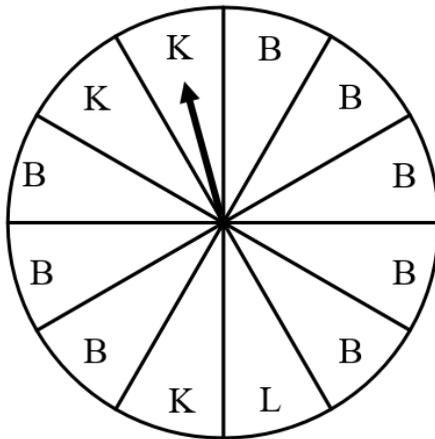| Cookie Dough	Price
Gingersnap	$3 per lb
Peanut Butter	$5 per lb
Double Chocolate	$3 per lb
Snickerdoodle	$6 per lb
Oatmeal Raisin	$4 per lb

13. Evaluate: 3.20(0.05)

Write your answer as a common fraction.

13. _____

14. If you spin the spinner 12 times, how many times would it be expected to land on B or L?

14. _____

15. A particular bacteria culture doubles in number every hour. There are 1,728 bacteria at noon. How many bacteria were there at 8 a.m. earlier that same day?
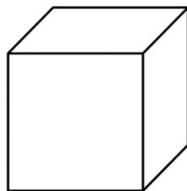
15. _____
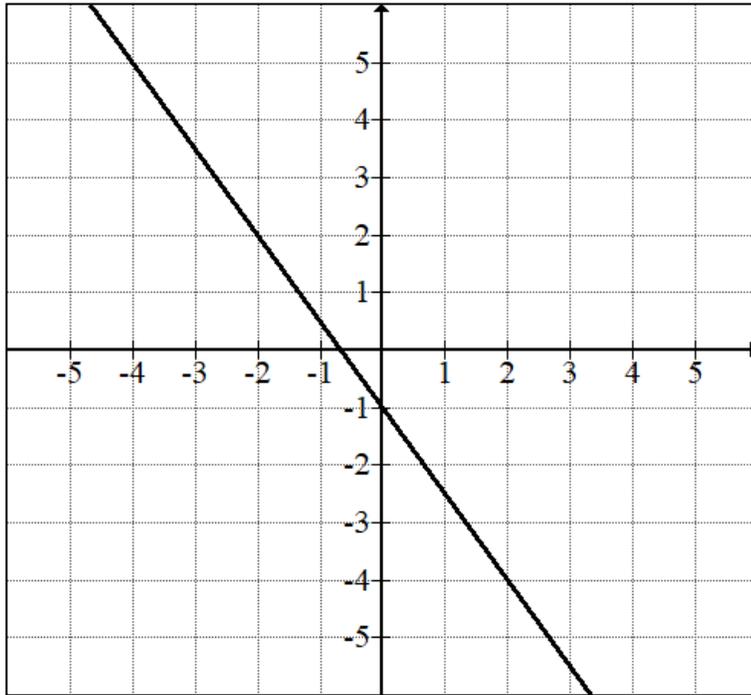
16. Simplify completely: $-2(4-1) + |3-5|$

16. _____

17. The volume of a cube is 27 cm^3. What is the total surface area, in square centimeters, of the cube?
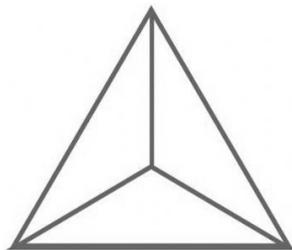
17. _____ sq cm

18. What is the slope of the graph?

18. _____

19. The figure shows a triangular pyramid, in which all of its four faces are equilateral triangles. The sum of all lengths of the edges is 72 cm. What is the length, in centimeters, of one edge?
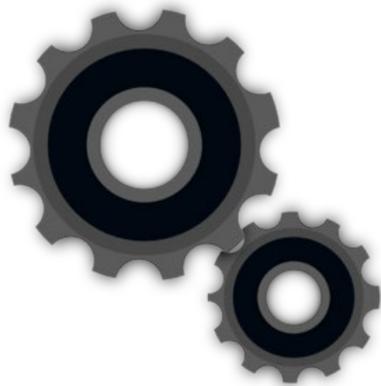
19. _____ cm

20. Solve for x: $3(5x + 3) = 7x - 23$

20. _____

21. A large gear makes 3 revolutions for every 7 revolutions a small gear makes. If the large gear makes 21 revolutions, how many revolutions does the small gear make?

21. _____

22. A box has 6 green, 5 red, 8 blue, 5 white, 7 yellow, and 9 brown LEGO pieces. What is the probability of a randomly selected LEGO piece that is blue? Write your answer as a common fraction.

22. _____

23. Define the operation ♦ as M ♦ L = (M + L)(M − L) for all integers M and L. What is the value of 5 ♦ 4?

23. _____

24. If the area of the shaded region is 4 square units, what is
the area of triangle *DBC* in square units?

24. _____ sq units

A   B

D   C
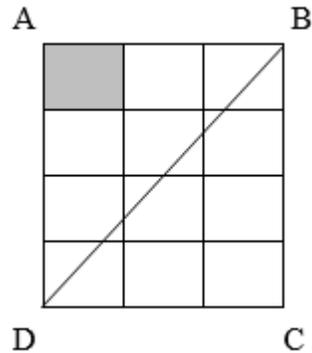
25. Find the positive difference between the mean and the mode
of this set of data:

25. _____

      2   2   4   4   4   6   6   8   18

26. A bag of 50-lb Chunky Nuggets dry dog food is 6 parts meat
and 3 parts filler. How many pounds of meat are in the bag?
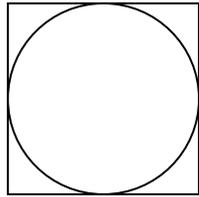Round your answer to the nearest pound.

26. _____ lb

27. The stem and leaf plot shows the height, in inches, of each student in Ms. Sanchez's math class. Find the median height of her students.

27. _____ in

Stem	Leaf
4	8 8 9
5	0 1 1 2 4 4 5 8 9
6	0 1

28. A circle is inscribed in a square whose side length is 14 cm. What is the area, in square centimeter, of the circle? Write your answer in terms of π.

28. _____ sq cm

29. Points A, B, C, and D lie on a line in that order. If $AB = 3$ units, $BC = 8$ units, and $AD = 16$ units, what is the ratio of AC to BD? Write your answer as a common fraction.

29. _____

30. The points $(4, 8)$ and $(3, y)$ fall on a line with a slope of 6. What is the value of y?

30. _____