

5 POINTS

1. How many rectangles (of any size) are there in the diagram?
There are 4 different sizes of rectangles: $4 + 3 + 2 + 1 = 10$

A. 5 B. 6 C. 8 D. 9 **E. 10**

2. Which of the 5 numbers below is twice the product of its digits?
Check each one. 36 is twice of 3×6 .

A. 32 B. 24 C. 16 D. 18 **E. 36**

3. Today is a Saturday and Surya checks his calendar to find out on what day of the week his birthday falls this year. If his birthday is in 55 days, on what day of the week is his birthday this year?
Days of the week repeat every 7 days; 49 days later is another Saturday so count ahead 6 more days and you get to Friday.

A. Tuesday B. Wednesday C. Thursday **D. Friday** E. Saturday

4. Two identical 10-inch rulers are placed together, as shown (not scaled). The 3 inch mark on one ruler is aligned with the 4 inch mark on the other ruler. What is the length of Z in inches?
The number 3 on the top ruler is 7 in from the left end. This is aligned with the 4 on the bottom one, which is 6 in from the right end. So $Z = 7 + 6 = 13$ inches.

A. 13 B. 14 C. 15 D. 16 E. 17

5. Eclipse Neighborhood has 120 houses, numbered consecutively from 1 to 120. Houses 39 to 47 inclusive are knocked down due to recent damage created by meteorites. How many houses remained in Eclipse Neighborhood?
Since 9 houses have been knocked down, $120 - 9 = 111$.

A. 94 **B. 111** C. 112 D. 110 E. 113

6. Andre looks at the word **LONGSHIP** (written in this font type) in a mirror. How many of the reflected letters never look the same as the original, no matter how Andre holds the mirror?
L, N, G, S, and P do not have symmetry lines, so these letters will not look the same in a mirror.

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

7. The first even number is 0, the second is 2, the third is 4, the fourth is 6, the fifth is 8, and so on. The 16th even number is ____.
The pattern is number order - 1 then multiply by 2. The 16th term is $(16-1) \times 2 = 30$

A. 26 B. 28 **C. 30** D. 32 E. 34

8. Josiah's mystery number is a 3-digit number where each digit is different. The product of its 3 digits is 24. The sum of the digits is equal to 11. The smallest digit of the mystery number is in the hundreds place while the largest is in the tens place. What is Josiah's mystery number?
The only combinations of 3 that work are (1, 3, 8), (2, 3, 4) and (1, 4, 6). Of those only 1, 4, 6 have a sum of 11. The smallest digit is 1 and largest is 6 so the number is 164.

A. 138 B. 234 C. 146 **D. 164** E. 183

7 POINTS

9. Students from Mrs. Hein's class are standing in a circle. They are evenly spaced and consecutively numbered starting with 1. The student with number 3 is standing directly across from the student with number 17. How many students are in Ms. Hein's class?
Since number 3 is across from number 17, there must be 13 students between them (half of the circle). Total students: $13 + 13 + 1 + 1 = 28$.

A. 28 B. 29 C. 30 D. 31 E. 32

10. In the land of Whoville, a plate of green eggs costs twice as much as a plate of ham. If a plate of ham costs \$1.50, how much would Mr. Mayor pay for 2 plates of green eggs and 3 plates of ham?
3 plates of ham cost $\$1.50 \times 3 = \4.50 . 2 plates of ham cost: $2 \times \$1.50 \times 2 = \6 . Total: $\$10.50$.

A. \$8.50 **B. \$10.50** C. \$9.00 D. \$7.50 E. \$15.00

11. Sam has two identical wooden pyramids, each with a square base. He glues the two bases together to make a new bigger wooden shape. How many vertices are there in the new bigger shape?
 $1 + 4 + 1 = 6$ vertices.

A. 6 B. 7 C. 8 D. 9 E. 10

12. What is the least number of coins that would give Malika a total of \$7.15 using only quarters and dimes?
Using mostly quarters to make \$7, we need at least 28 quarters. However, using only dimes, we can't make \$0.15. Therefore, we use 27 quarters (\$6.75) and 4 dimes (\$0.40) to make \$7.15, which totals 31 coins.

A. 28 B. 29 C. 30 **D. 31** E. 32

13. Jed went for a five-hour walk. His average speed was between 3 km/h and 4 km/h. Which of the following could be the distance he walked?
With the speed of 3 km/h, he would travel $3 \times 5 = 15$ km. With the speed of 4 km/h, he would travel $4 \times 5 = 20$ km. Only 19 km lies in this interval.

A. 9 km B. 12 km C. 14 km **D. 19 km** E. 24 km

14. A small ink cartridge has enough ink to print 600 pages. Three small cartridges can print as many pages as two medium cartridges can print. Three medium cartridges can print as many pages as two large cartridges can print. How many pages can a large cartridge print?
Two medium cartridges can print as many pages as three small cartridges (1800 pages). Three medium cartridges can print $1800 / 2 \times 3$ pages = 2700 pages, which is the same number of pages as what two large cartridges can print. So, one large cartridge can print $2700 / 2 = 1350$ pages.

A. 1200 **B. 1350** C. 1500 D. 2400 E. 2700

15. Five fishermen, Ahe, Bahe, Cahe, Don, and Zella, all wanted to go out fishing for the day but they only had three fishing poles and were not smart enough to make more, so only three of them could go out each day. How many days could a group of three fishermen go fishing without having the exact same group of three going again?
Easiest way to solve this problem is to make a list: ABC, ABD, ABZ, ACD, ACZ, ADZ, BCD, BCZ, BDZ, and CDZ. There are 10 possible different groups.

A. 25 B. 20 C. 15 D. 12 **E. 10**

10 POINTS

16. A banker puts \$600 into 6 boxes. Each box is worth \$1 more than the previous box. How much was placed in the third box? Assuming the first number is Y , the second number is $Y+1$, and the third number is $Y+1+1$, and so on.
 $Y+Y+1+Y+2+Y+3+Y+4+Y+5 = \$600 \rightarrow 6Y+15 = \600 . $Y = \$97.50$. The 3rd number is \$2 more than the first: $\$97.50 + \$2 = \$99.50$.



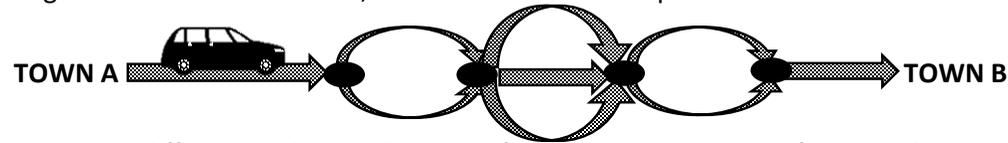
- A. \$100 B. \$100.50 C. \$99 **D. \$99.50** E. \$98

17. Justin has a pile of quarters worth \$780. Altogether, the quarters weigh 39 pounds. Given that there are 16 ounces in a pound, how many quarters are in one ounce of weight? Since \$780 of quarters weigh 39 pounds, convert to number of quarters then quarters to ounces; $\$780 \times 4$ quarters per dollar = 3,120 quarters; 39 pounds \times 16 ounces = 624 ounces; $3,120/624 =$ number of quarters per ounce of weight = 5.



- A. 50 B. 20 C. 10 **D. 5** E. 1.25

18. To go from Town A to Town B, a car can take different paths illustrated below:



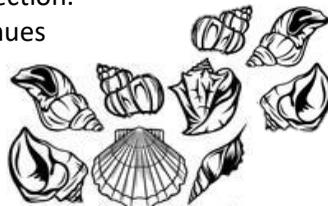
How many different paths can the car go from Town A to Town B if it can only go on one-way roads (indicated by arrows), and it cannot pass any intersection (dot) more than once?
 There are 2 roads to choose from the first dot to the second, 3 roads from the second dot to the third, and 2 roads from the third to the road leading to Town B: $2 \times 3 \times 2 = 12$ paths.

- A. 8 **B. 12** C. 6 D. 14 E. 7

19. Mr. Cho received a container of fresh eggs. He sold $1/3$ of the eggs in the morning and sold 320 eggs in the afternoon. At the end of the day, he found that $1/4$ of the eggs were not sold. How many eggs did he receive? Mr. Cho received $(1/3 \text{ of total eggs}) + 320 + (1/4 \text{ of total eggs})$. 320 eggs represent $1 - 1/4 - 1/3 = 5/12$ of total eggs. $1/12$ of total eggs = $320/5 = 64$. Total eggs $(12/12) = 64 \times 12 = 768$

- A. 768** B. 448 C. 549 D. 1224 E. 1600

20. Chelsie collects sea shells. Each day she adds 4 shells to her collection. At the end of 3 days she has a total of 50 sea shells. If she continues this pattern, after how many days will she have 262 sea shells? After 3 days, she has 50; after 2 days, she has 46; after 1 days, she has 42; and she started at 38 shells. She will have 262 shells after: $(262 - 38)/4 = 56$.



- A. 55 **B. 56** C. 57 D. 58 E. 59

MATH CHALLENGE TOURNAMENT

FALL 2016



Problem Solving Challenge

Grade 4

Problems 1-20

Do not begin until you are instructed to do so.

KEY

Problem Solving Challenge (40 minutes)

Mark your answers on the ANSWER SHEET.
 You may use scratch paper to do any calculation to reach final answers.