

1. By how much is $\frac{9}{2}$ greater than $\frac{2}{9}$?

- A. $\frac{18}{77}$
- B. $\frac{18}{7}$
- C. $\frac{18}{77}$
- D. $\frac{18}{7}$
- E. $\frac{7}{81}$

2. Julian divided a prime number by an even number. Which of the following cannot be the result of Julian's division?

- A. Even number
- B. Odd number
- C. Whole number
- D. Rational number
- E. Fraction

Solution: Solve this problem by eliminating the answer choices by taking examples of a prime number and an even number. As 2 is both a prime number and an even number, it is good starting point to eliminate as many answer choices as possible. When we divide the prime number 2 by the even number 2, we get 1. This is an *odd number*, *whole number* and a *rational number*, hence eliminating three choices. By taking any other prime number example, say 3, and dividing by an even number, say 2, we get a fraction, hence eliminating *fraction*. The only answer choice that cannot be obtained is *even number*.

3. A box contains a collection of quarters, dimes, nickels and pennies. Jim picked four coins randomly from the box. Which of the below cannot be the sum of the four coins that Jim picked?

- A. 55
- B. 45
- C. 35

- D. 25
- E. 15

4. Which of the following is the smallest?

- A. 5.76545
- B. $5.765\overline{4}$
- C. $5.7\overline{654}$
- D. $5.\overline{7654}$
- E. $5.\overline{7654}$

5. One-third more than 75 is one-fifth less than what number?

- A. 80
- B. 100
- C. 120
- D. 125
- E. 150

6. If the ratio of x to y is $2:7$, which of the following equations must be true?

- A. $x-y = 5$
- B. $xy = 14$
- C. $7x=2y$
- D. $2x=7y$
- E. $x+y=9$

7. It takes Lori 30 minutes to walk uphill 1 mile from her home to school, but it takes her only 10 minutes to walk from school to her home along the same route. What is her average speed, in miles/hour, for the round trip?

- A. 3
- B. 3.125
- C. 3.5
- D. 4
- E. 4.5

Levels 5 & 6

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Critical Thinking Math

8. How many two-digit numbers have digit-sum that is a perfect square? (note: digit-sum is the sum of the digits in a number)
- A. 14
B. 15
C. 16
D. 17
E. 18
9. Ashley spent $\frac{1}{7}$ of her money on food, and $\frac{1}{3}$ of her remaining money on cloths. She then had \$36 left. How much did she spend on food?
- A. \$63
B. \$54
C. \$18
D. \$12
E. \$9
10. Box X contains 4 marbles labelled 4, 6, 8 and 10. Box Y contains 4 marbles labelled 3, 5, 7 and 9. If Henry draws one marble from box X and one marble from box Y, how many different values are possible for the sum of the two numbers on the marbles?
- A. 6
B. 7
C. 8
D. 12
E. 16
11. If the sum of 7 consecutive numbers is 259, what is the sum of the first and last numbers?
- A. 34
B. 37
C. 74
D. 111
E. It cannot be determined based on the given information

12. Tiffany correctly solved 75% of questions on a 40-question exam, 80% of questions on a 30-question exam and 90% of questions on a 20-question exam. What percent of all questions did Tiffany solve correctly?
- A. 80%
B. 84%
C. 85%
D. 86%
E. 88%
13. Triangle ABC has side lengths of 20, 20 and 32. Triangle XYZ has side lengths of 20, 20 and 24. What is the ratio of the area of triangle ABC to the area of the triangle XYZ ?
- A. 1 : 1
B. 4 : 3
C. 3 : 4
D. 16 : 9
E. 9 : 16
14. If a , b , and c are positive integers where $ab = 24$, $ac = 48$, and $bc = 72$, then $a+b+c$ is
- A. 16
B. 18
C. 20
D. 22
E. 24
15. Of the following, which number is divisible by 3?
- A. $10^{100} + 1$
B. $10^{500} + 5$
C. $10^{600} + 6$
D. $10^{700} + 7$
E. $10^{900} + 9$

16. The perimeter of a square is equal to the perimeter of a particular rectangle. The area of the rectangle is equal to 35. If the side lengths of both the square and rectangle are single-digit whole numbers, what is the area of the square?

- A. 16
- B. 25
- C. 36
- D. 49
- E. 64

17. Three friends Xavier, Yancey and Zara each have some cash. They redistribute their money as follows: Xavier gives enough money to Yancey and Zara to double their respective amounts. Yancey gave enough money to Xavier and Zara to double their respective amounts. Finally, Zara gave enough money to Xavier and Zara to double their amounts. If Zara has \$24 when they begin and \$24 when they end, what is the total amount that all three friends have?

- A. 168
- B. 144
- C. 96
- D. 72
- E. 192

18. Each letter P , Q , R and S stands for different digits in the below addition and subtraction. What is the value of S ?

$$\begin{array}{r}
 + \quad P \ Q \\
 \quad R \ P \\
 \hline
 \quad S \ P
 \end{array}
 \qquad
 \begin{array}{r}
 \quad P \ Q \\
 - \quad R \ P \\
 \hline
 \quad P
 \end{array}$$

- A. 1
- B. 3
- C. 5
- D. 7
- E. 9

19. If the product of all prime numbers between 1 and 105 is divided by 105, what is the remainder?

- A. 0
- B. 1
- C. 2
- D. 3
- E. 4

20. How many whole numbers between 0 and 1000 do not contain the digit 9?

- A. 812
- B. 728
- C. 684
- D. 648
- E. 480