

Ciphering Fall Classic 2005

Name_____

School_____

Grade_____

ID #_____

1) Find $A + B + C$ given that: (answer must be a decimal)

$$A = \frac{1}{2} + \frac{1}{4} \div \frac{1}{16}$$

$$B = .1 + .2 \times .3$$

$$C = 20\% \text{ of } 7.2$$

ANSWER_____ 6.1

2) The sum of the digits of a positive two-digit integer is greater than or equal to 14. What is the sum of all such integers?

ANSWER_____ 1,265

3) How many ordered pairs of positive integers (x, y) are solutions to the equation $5x + 3y = 29$?

ANSWER_____ 2

4) The number 210 can be written as the sum of consecutive positive integers in several ways. When written as the sum of the greatest possible number of consecutive positive integers, what is the largest of these integers?

ANSWER_____ 20

5) How many of the positive integral factors of 21,600 are perfect squares?

ANSWER_____ 12

6) A cube whose edges measure 8cm is constructed from smaller white cubes whose edges measure 1cm. If the large cube has all its faces painted black, except the bottom face, how many of the smaller cubes will have exactly two faces painted black?

ANSWER_____ 52

7) Evaluate:

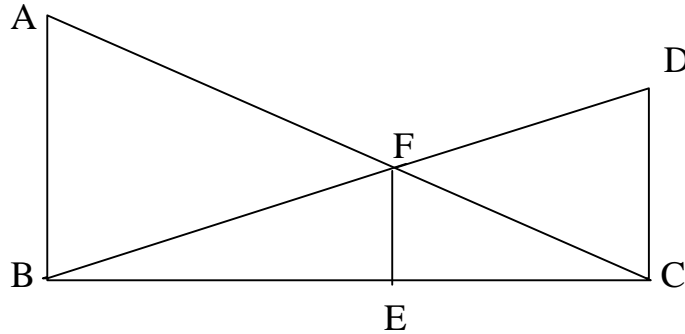
$$1.\bar{1} + 2.\bar{2} + 3.\bar{3} + \dots + 9.\bar{9}$$

ANSWER _____ 50

8) If it takes 3,001 digits to number all the pages of a book beginning with page 1, how many pages does the book have?

ANSWER _____ 1,027

9) Triangle ABC and triangle DCB are right triangles $AB = 7$, $DC = 5$ and $BC = 12$. If segment EF is perpendicular to segment BC, express the length of segment EF as a common fraction. (AB and DC are also perpendicular to BC)



ANSWER _____ $\frac{35}{12}$

10) Find the smallest positive two-digit number such that the number is twice the product of its digits.

ANSWER _____ 36

11) Find the arithmetic mean of the first string of seven consecutive positive integers that are all composite.

ANSWER_____ 93

12) In the following division problem, find the value of C, given that each letter is a distinct digit.

$$\begin{array}{r} 1B \\ A \overline{)C7} \\ \underline{A} \\ 3B \\ \underline{D5} \\ E \end{array}$$

ANSWER_____ 8

13) Ashley, Brett, Chris and Diane are competing in a race. Eric sees the race and comments,

- 1) "Ashley beat both Brett and Chris"
- 2) "Diane finished between Brett and Chris"

If exactly one of his statements is correct, and there are no ties, how many different orders of finish are possible?

ANSWER _____ 12

14) What is the probability, expressed as a fraction, that a randomly selected positive integer less than 101 is even or a multiple of three, but not both?

ANSWER _____ $\frac{51}{100}$ or 61/100

15) The six Brown children were all born exactly two years apart. When Chad, the youngest of the Brown children was 1 year old, the sum of all the ages of the Brown children was $1 + 3 + 5 + 7 + 9 + 11 = 36$, which is a perfect square. How old will Chad be the next time the sum of the ages of all the Brown children will be a perfect square?

ANSWER_____ 19

16) The operators “+”, “÷”, and “-“ are inserted once each in the following expression. Express as a common fraction the probability that the result will be positive.

$$7 ____ 8 ____ 9 ____ 5 =$$

ANSWER_____ $\frac{5}{6}$

17) On a 26-question test, 6 points are deducted for each wrong answer, and x points are credited for each correct answer, x being an integer less than 20. If all the questions are answered, how many are correct if the score is zero?

ANSWER: _____ 12

18) Twelve points are equally spaced on the circumference of a circle. How many chords can be drawn that connect pairs of these points and are longer than the radius of the circle but shorter than its diameter?

ANSWER_____ 36

19) The host of a party says, "I have three daughters, the product of whose whole number ages is 72. The sum of their ages is my house number. Can you tell me their ages?"

A guest, who knows the house number, answers, "I need more information."

"Okay," says the host, "the oldest likes puzzles."

"Now I know their ages," says the guest.

What are the ages of the host's daughters?

ANSWER_____ 3, 3, 8

20) Connor was born on May 11, 1997, which was Mother's Day.

By the time he is 80, how many times will Connor's birthday (not including the day of his birth) have been on Mother's Day?

