

Delta College Middle School Math Competition - Practice Test C

1) Tanya has \$3.40 in nickels, dimes, and quarters. If she has seven quarters and four dimes, how many nickels does she have:

- a) 21 b) 22 c) 23 d) 24 e) 25

2) Several rectangles with a perimeter of 14 inches have widths and lengths that are a natural number of inches. HOW MANY different areas are possible for these rectangles?

- a) 1 b) 2 c) 3 d) 4 e) 5

3) In the sequence **2157413334** shown below, note that exactly two sets of consecutive digits sum to 11. **7+4=11** and **4+1+3+3=11** (note that two such sets ARE ALLOWED to overlap)

2157413334 and **2157413334**

In the sequence, **743425631**, how many different sets of consecutive digits sum to 11?

- a) 1 b) 2 c) 3 d) 4 e) More than 4

4) What is the smallest whole number value of N such that 30^N is larger than 10 billion?

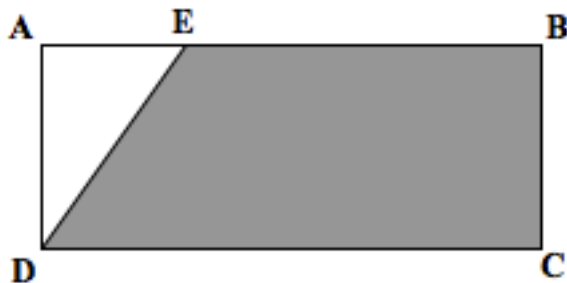
- a) 5 b) 6 c) 7 d) 8 e) 9

5) In basketball, a player can score by making 2-point shots, 3-point shots, and 1-point for each free throw made. In a game, Prince makes five of eight 2-point shots and three of twelve 3-point shots. In addition, he attempted 20 free throws. If he scored a total of 28 points, how many free throws did prince make?

- a) 9 b) 10 c) 11 d) 12 e) 13

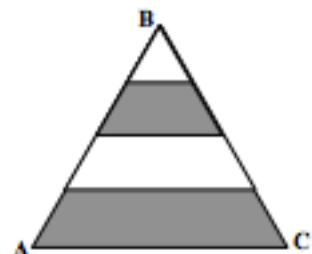
6) In rectangle ABCD, $BC = 4$, $CD = 10$, and $BE = x$. What is the area of the shaded region?

- a) $20+2x$ b) $20+4x$ c) $40 - \frac{x}{2}$ d) $20+x$ e) $40+2x$



7) To swim 800 m in her family's rectangular pool, Fran could swim the length 50 times or she could swim the perimeter of the pool 16 times. In square meters, what is the area of the pool?
a) 196 b) 144 c) 400 d) 544 e) 800

8) ABC is an equilateral triangle divided into four strips of equal width. What fraction of the triangle ABC is shaded?
a) $\frac{1}{2}$ b) $\frac{3}{4}$ c) $\frac{5}{8}$ d) $\frac{7}{12}$ e) $\frac{9}{16}$



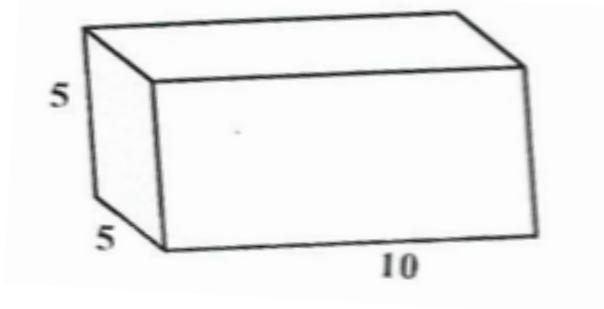
9) A ream of paper containing 500 sheets is 8 cm thick. How many sheets of paper are in a stack 5.6 cm high?
a) 300 b) 310 c) 320 d) 340 e) 350

10) A standard six-sided die with faces labeled 1 through 6 is rolled. One face is face-down on a table. Let P equal the product of the other five numbers. What is the largest number that **must** be a factor of P?
a) 6 b) 8 c) 12 d) 24 e) 30

11) No prime number greater than 11 ends with the digit:
a) 1 b) 3 c) 5 d) 7 e) 9

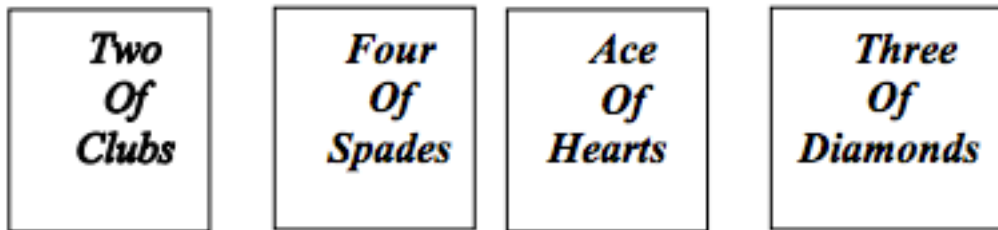
12) Before conference swim championships, Suzanne's best time in the 200 yard butterfly race was 2 minutes, 23 seconds. In the conference championships, she won 10th place by swimming the 200-yard butterfly in 2 minutes, 15 seconds. What percent decrease is that?
a) 3.6% b) 5.6% c) 5.9% d) 6.2% e) 36.9%

13) The six faces of a 5x5x10 rectangular block of wood are painted red and then the block is cut into 250 1x1x1 unit cubes. Of these 250 unit cubes, how many have exactly 2 faces painted red?
a) 56 b) 64 c) 68 d) 72 e) 80



14) A deck consists of 16 cards , the **ACE, TWO, THREE,** and **FOUR** of each of the four suits: **spades , hearts, clubs,** and **diamonds** . In how many different ways can one row of four cards from these 16 cards be dealt such that the row contains one card of each rank (ace, two, three, four) and also one card of each suit? For example, this row of four cards meets these conditions: (Note: The order of the four cards from left to right IS significant.)

- a) 24 b) 256 c) 576 d) 6,144 e) 43,680

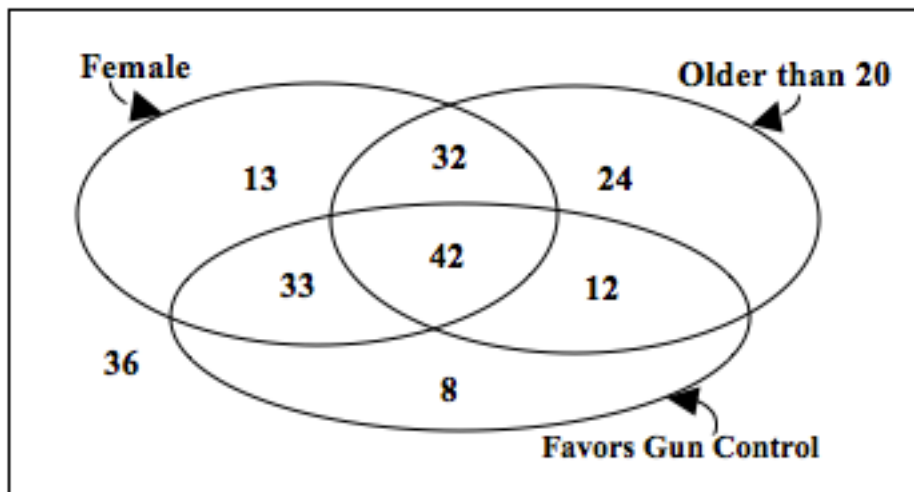


15) If it takes Jeremy 18 hours to dig a 2 meter by 2 meter hole, how many hours would it take three men (each working at the same rate of Jeremy) to dig a 4 meter by 4 meter hole?

- a) 12 b) 18 c) 24 d) 36 e) 48

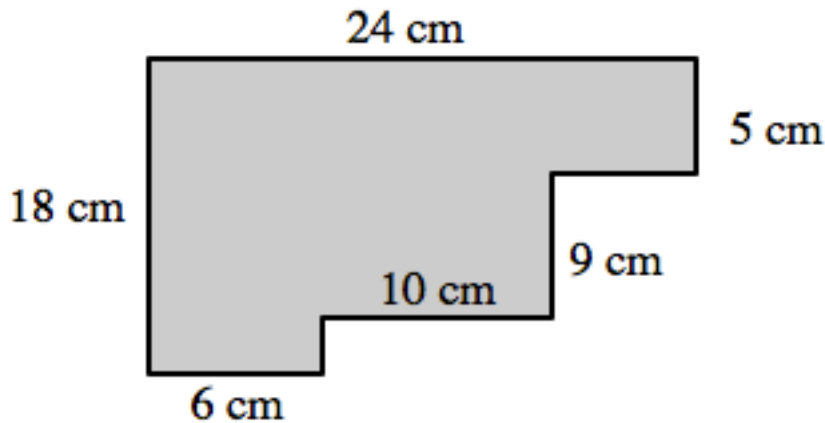
16) The Venn diagram represents the results of a survey of 200 people concerning whether or not they favor gun control. How many males in the survey did not favor gun control?

- a) 24 b) 36 c) 60 d) 69 e) 105



17) The area, in square centimeters, of the shaded region is: [Note: The figure is not drawn to scale.]

- a) 288 b) 306 c) 314 d) 320 e) 336



18) Place one digit in each black square to make a correct subtraction problem. What is the sum of the digits in the five boxes?

- a) 25 b) 26 c) 27 d) 28 e) 29

$$\begin{array}{r} 6 \blacksquare 4 \blacksquare 3 \\ - \blacksquare 482 \blacksquare \\ \hline 9 \blacksquare 47 \end{array}$$

19) In the 120 mile drive from St. Louis to Columbia, a driver averaged 64 miles per hour from St. Louis to Wentzville and then 74 miles per hour from Wentzville to Columbia. Wentzville is one-third of the way from St. Louis to Columbia. On the drive from St. Louis to Columbia, what was the driver's average speed? Round to the nearest tenths of a mile an hour?

- a) 69.0 mph b) 69.8 mph c) 70.0 mph d) 70.3 mph e) 70.7 mph

20) Each vertical row of numbers and each horizontal row of numbers is either an increasing arithmetic sequence or a decreasing arithmetic sequence ?

(Note: **42 , 37 , 32 , 27** is an example of a decreasing arithmetic sequence .)

What is $A + B$?

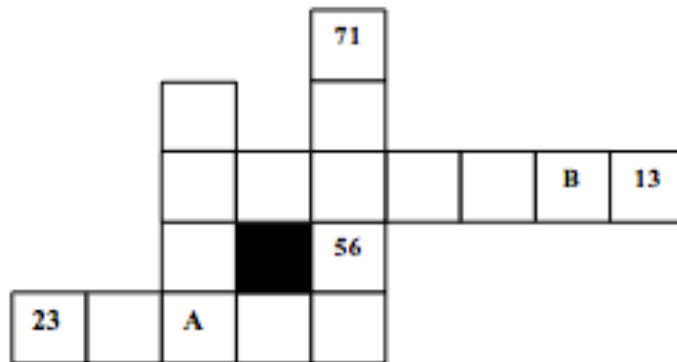
a) 93

b) 95

c) 99

d) 100

e) 101



21) Each of these six cards has a natural number on one side and a shape on its other side. What is the minimum number of cards that must be turned over to determine whether the following statement is TRUE ?

“ If the number on one side of a card is odd , then the shape on the other side of that card is a square. “

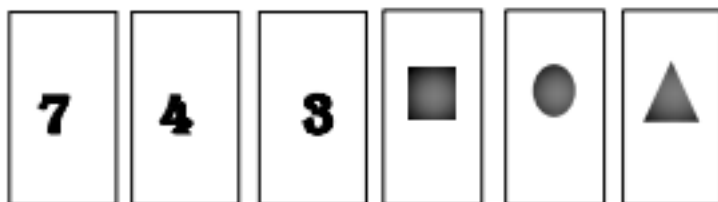
a) 2

b) 3

c) 4

d) 5

e) 6



22) How many whole numbers from **1 to 2000** have their “ sum of digits “ equal to **25** ?

a) 10

b) 12

c) 13

d) 15

e) 16

23) How many positive integers less than a 1000 can be written using only the digits “ **0** “ and/or “ **5** “ ?

a) 4

b) 5

c) 6

d) 7

e) 8

24) The sum of four consecutive odd numbers equals the sum of five consecutive even numbers. Which one of the following five numbers could NEVER be one of the nine numbers referred to in this problem ?

- a) 745 b) 746 c) 747 d) 748 e) 749

25) How many two-digit prime numbers have a units digit of " 7 " ?

- a) 4 b) 5 c) 6 d) 7 e) 8

26) One side of square A is five times the length of one side of square B. How many times greater is the area of square A than the area of square B?

- a) 5 b) 10 c) 15 d) 20 e) 25

27) A 16-liter mixture of fruit punch and soda is 25% soda. After 75% of the mixture is drunk, 4 liters of fruit punch and 4 liters of soda are added. What percent of the new mixture is soda? Round to the nearest percent.

- a) 33% b) 35% c) 40% d) 42% e) 50%

28) In basketball, a player can score by making 2-point shots, 3-point shots, or 1 point for each free throw made. In one game, Loni made four of seven 2-point shots, two of five 3-point shots, and attempted 16 free throws. If she scored 24 points, what percent of her free throws did she make?

- a) 37.5% b) 50% c) 60% d) 62.5% e) $66\frac{2}{3}\%$

29) A basketball team has won seven of its first fifteen games. How many wins in their next ten games will raise their winning percentage for the season to 60%?

- a) 2 b) 6 c) 7 d) 8 e) 9

30) In the following expression, the variables a, b, c, and d are replaced by the numbers 1, 2, 3, and 4, but not necessarily in that order. Each letter is for a different number. What is the minimum possible value of: $a \cdot b^c - d$?

- a) -2 b) -1 c) 0 d) 1 e) 2

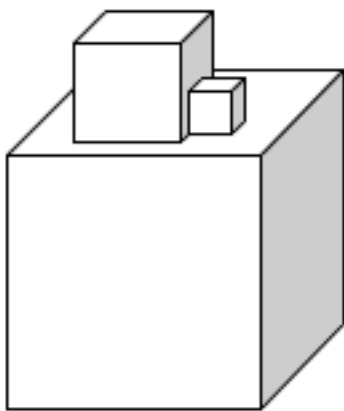
31) A number x is doubled, the result is increased by 6, then that result is halved. The final answer is 36.

A number y is divided by 3, the result is decreased by 6, then that result is tripled. The final answer is 36.

The sum x+y equals:

- a) 52 b) 57 c) 66 d) 82 e) 87

- 32) As shown, a sculptor attaches a 4-meter cube to the top of a 7-meter cube and then places the small 2-meter cube so that its faces touch both the 4-meter cube and the 7-meter cube. In square meters, what is the surface area (including the base) of the completed sculpture?
- a) 362 b) 366 c) 370 d) 374 e) 382



- 33) $6x^3 - 6x^2 + 2x - 28 = (2x + A)(3x^2 + Bx + 7)$. What is $A + B$?
- a) -3 b) -1 c) 2 d) 3 e) 4

- 34) Complete this 4 by 4 grid so that the numbers 1, 2, 3, and 4 occur in every row and in every column. In addition, the three greater than and less than symbols indicate which of the two adjacent numbers is larger or smaller. What is the sequence of numbers in the SECOND row (from the top)?
- a) 2341 b) 3421 c) 3241 d) 4231 e) 4321

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35) The base of this pyramid is a rectangle ABCD with $AB = 10$ cm and $BC = 18$ cm. The height of the pyramid is 12 cm. Also, $AE = BE = CE = DE$. What is the sum of the areas, in square centimeters, of the five faces of this pyramid?

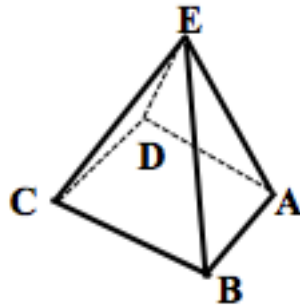
a) 516

b) 524

c) 544

d) 564

e) 600



36) A backpacking group plans to leave the Rock at 11:00 AM, walk past Heartbreak Hill, and finish at Taum Sauk Peak. The total hiking distance will be 12 km. Hiking at an average rate of 3 km/hr, they arrive at Heartbreak Hill at 12:45 PM. In order to reach Taum Sauk Peak by 2:00 PM, how fast, in kilometers per hour, will they have to walk from Heartbreak Hill to Taum Sauk Peak?

a) 3.5

b) 4.2

c) 4.5

d) 5.1

e) 5.4

37) *Three-Pile Nim* is a two-person game. Pattie and Malik take turns. There are three piles of chips. On each turn, a player takes one or more chips from any ONE pile. The player to take the last chip wins.

At one point of the game, there are 1 chip, 2 chips, and 6 chips remaining in the three piles.



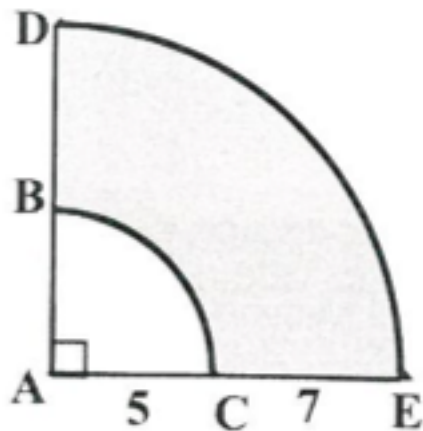
It is Malik's turn. If both players make their best plays, there is only one winning play for Malik. What is it?

- a) Take 1 chip from the 6-chip pile
- c) Take 3 chips from the 6-chip pile
- e) Take 1 chip from the 1-chip pile

- b) Take 2 chips from the 6-chip pile
- d) Take 1 chip from the 2-chip pile

38) ABC and ADE are quarter-circles each with center A. AC = 5 cm and CE = 7 cm. What is the area of the outer region DBCE? Round to the nearest tenth of a square centimeter.

- a) 3.1 b) 18.8 c) 93.5 d) 113.1 e) 373.8



39) The product of three numbers in each row and in each column is given. Without repetition, place the numbers 1 through 9 in these nine cells to produce these six products. What is the number in the cell marked N?

- a) 1 b) 2 c) 3 d) 4 e) 6

			54
	N		42
			160
35	96	108	

40) The date of the second Thursday of a month is a square number. The last Monday of the month is on the:

- a) 26th b) 27th c) 28th d) 30th e) Can't be determined