

2007-08 Grade 9 CHAMP Math Contest

Part A: (5 credits each)

- The value of $4 + (3 - 5)^2 \times 2$ is:
a) -46 b) -4 c) 16 d) 0 e) 12
- If 60 marbles are divided into 3 piles in the ratio 1:3:6, how many marbles are in the largest pile?
a) 18 b) 20 c) 30 d) 36 e) 10
- The number of degrees the minute hand of a clock passes through between 9:48 A.M. and 10:15 A.M. is:
a) 198° b) 27° c) 153° d) 87° e) 162°
- If the circumference of a circle is π , then the area of the circle is:
a) $\frac{\pi}{4}$ b) $\frac{\pi}{2}$ c) π d) 2π e) 4π
- A bag contains 100 jellybeans, 20 of which are red, 20 of which are yellow, 20 of which are green, 20 of which are orange, and 20 of which are black. The least number of jellybeans that a blindfolded person must eat to be certain of having eaten at least one of each colour is:
a) 5 b) 24 c) 60 d) 80 e) 81
- If m pens are bought at n dollars each, and n pens are bought at m dollars each, then the average cost per pen, in dollars, is:
a) mn b) $\frac{2mn}{m+n}$ c) $\frac{m+n}{2}$ d) 1 e) $\frac{m^2n^2}{2}$
- How many of the integers between 2 and 50 can be written in the form x^y , where x and y are positive integers and $y \neq 1$?
a) 8 b) 9 c) 10 d) 11 e) 12
- Michael sleeps $\frac{3}{8}$, eats $\frac{1}{9}$, and works $\frac{1}{3}$ of the day. How many minutes in his day are unaccounted for?
a) 360 b) 1080 c) 260 d) 1180 e) 650
- What is the next number in the sequence: 0, 1, 1, 2, 4, 7, 13, 24 ?
a) 30 b) 37 c) 41 d) 44 e) 48

2007-08 Grade 9 CHAMP Math Contest

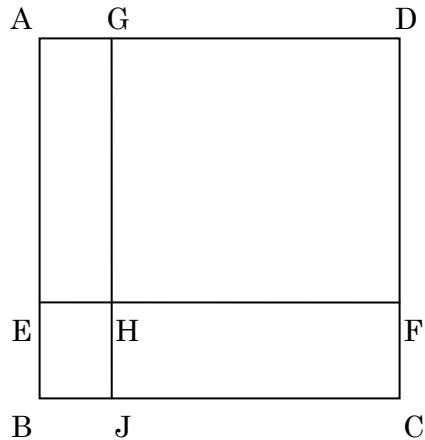
10. The numbers from 1 to 5 are written in a 5x5 array so that each number appears once in each row and column. Some of the numbers have already been entered. What number goes in the place marked by the X?

	2		5	
	3		2	
1				4
			4	3
5		X		

- a) 1 b) 2 c) 3 d) 4 e) not enough info given

Part B: (6 credits each)

11. A rectangle is divided into three rectangles of different areas and a square GHFD. The area of rectangle AEHG is 28 cm^2 and the area of rectangle HJCF is 35 cm^2 . If all the rectangles have dimensions which are integers, the area of the square GHFD, in cm^2 , could be:



- a) 35 b) 36 c) 49 d) 16 e) 9

12. If $xy = 6$, $yz = 9$, $xz = 24$, then the value of xyz could be:

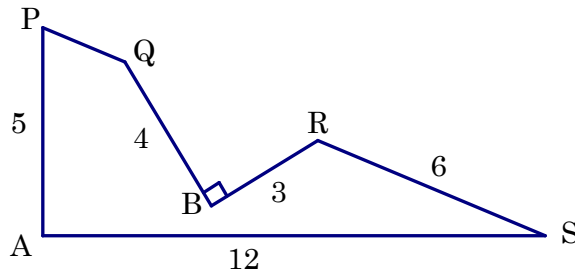
- a) 648 b) 1296 c) 48 d) $\frac{3}{2}$ e) 36

13. If $a^b = \frac{a^2 b^2}{2b - a}$, then $(2^3)^4$ is:

- a) -576 b) -144 c) 1296 d) -1296 e) 216

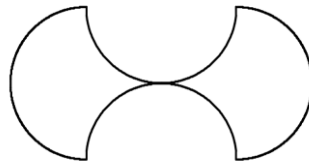
2007-08 Grade 9 CHAMP Math Contest

14. In the diagram, if P, Q, R, and S lie on a straight line, the perimeter of the figure is:



- a) 28 b) 30 c) 32 d) 33 e) 38

15. The figure below is constructed of four semi-circles, each with a diameter of one unit. The area, in square units, of the interior of the figure is:



- a) 1 b) $\pi\sqrt{2}$ c) $\frac{\pi}{4}$ d) π e) $\frac{\pi}{2}$

16. Counting your parents as the first generation, your grandparents as the second generation and so on, how many ancestors did you have in total in the last 10 generations?

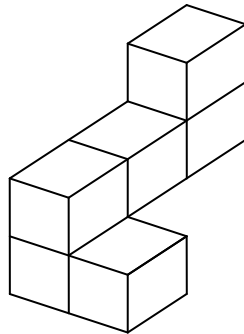
- a) 132 b) 1024 c) 2046 d) 2048 e) 4094

17. What is the product of the following set of numbers?

$$\left(1 + \frac{1}{2}\right)\left(1 + \frac{1}{3}\right)\left(1 + \frac{1}{4}\right) \dots \left(1 + \frac{1}{99}\right)\left(1 + \frac{1}{100}\right)$$

- a) 1 b) $\frac{101}{2}$ c) 50 d) $\frac{101}{200}$ e) $\frac{1}{100}$

18. The object shown in the diagram below is made by gluing together wooden cubes, each having edges of length 1 cm. What is the total surface area of the object, in cm^2 ?



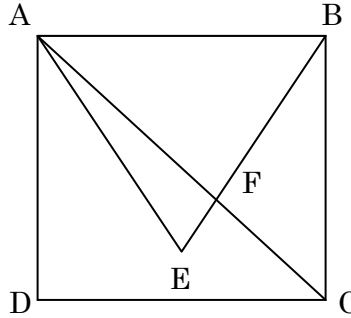
- a) 31 b) 13 c) 36 d) 26 e) 30

2007-08 Grade 9 CHAMP Math Contest

19. January 1, 2007 occurred on a Monday. In which year, will January 1 occur on a Monday again?

- a) 2012 b) 2014 c) 2016 d) 2017 e) 2018

20. If ABCD is a square and ABE is an equilateral triangle, then the measure of $\angle BFC$ is:



- a) 60° b) 75° c) 95° d) 105° e) 120°

Part C: (8 credits each)

21. A license plate number consists of exactly six digits. How many different plates can be created in which the sum of the digits is 52 or greater?

- a) 3 b) 15 c) 22 d) 28 e) 36

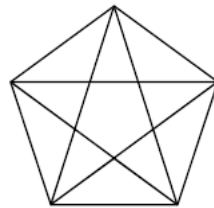
22. Moe has \$4.50, consisting of nickels, dimes, and quarters. He has twice as many dimes as nickels and four times as many dimes as quarters. The number of dimes he has is:

- a) 12 b) 24 c) 6 d) 14 e) none of these

23. Two men and two boys wish to cross a river. Their small boat will carry the weight of only one man or two boys. The minimum number of times the canoe must cross the river to get all four people on the opposite shore is:

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

24. How many different triangles are contained in the figure below?



- a) 10 b) 15 c) 20 d) 25 e) more than 25

25. If each edge of a cube is increased by 300%, the percentage increase in the surface area is:

- a) 1600% b) 300% c) 900% d) 1500% e) none of these