

2007-08 Grade 10 CHAMP Math Contest

Part A: (5 credits each)

1. You buy a pen for \$5, sell it to your friend for \$7, buy it back from your friend for \$9, and finally sell it to your mother for \$11. How much money did you make?

- a) \$ 0 b) \$ 2 c) \$ 4 d) \$ 6 e) none of these

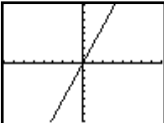
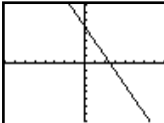
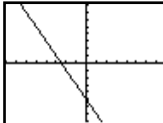
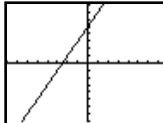
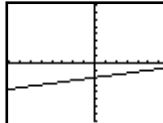
2. Dividing 85 by one-fifth and adding twenty yields:

- a) 33 b) 37 c) 445 d) 8500 e) none of these

3. What is the equation of a line with slope 2 and x -intercept 9?

- a) $2x - y - 9 = 0$ b) $2x + y - 9 = 0$ c) $x - 2y - 18 = 0$ d) $y = 2x + 9$ e) none of these

4. Which of the following calculator screens could represent $2x + y - 4 = 0$?

- a)  b)  c)  d)  e) 

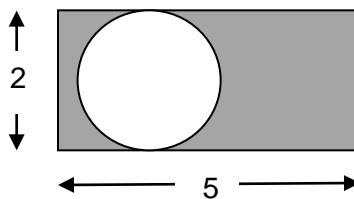
5. Determine the next term in the following sequence: 1, 1, 2, 3, 5, 8, 13, 21, 34,

- a) 47 b) 55 c) 56 d) 89 e) none of these

6. If, $a = 3$, $b = -1$, and $c = 2$, what is the value of $\frac{(a-b)^2}{b^3c}$?

- a) -1 b) 1 c) 8 d) -8 e) none of these

7. Using 3.14 as an approximation for π , the approximate area of the shaded region below is:



- a) 3.72 b) 5.80 c) 6.86 d) 13.14 e) none of these

8. Ten people met at a party. They all exchanged handshakes with each other once. How many handshakes were there in total?

- a) 10 b) 20 c) 45 d) 56 e) none of these

9. What is the sum of all the factors of 28?

- a) 12 b) 28 c) 45 d) 56 e) none of these

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

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

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Part B: (6 credits each)

11. If the lines defined by the equations $5x - 4y + 7 = 0$ and $4x + ky + 3 = 0$ are parallel, the value of k is:

- a) $\frac{16}{5}$ b) $-\frac{16}{5}$ c) -5 d) 5 e) none of these

12. Solve for x in the equation: $3(x - 5) - 2(x + 2) = 6$.

- a) 7 b) 13 c) 17 d) 25 e) none of these

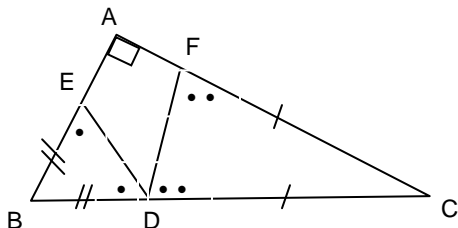
13. Find the smallest number bigger than 100 that has an odd number of different factors.

- a) 100 b) 101 c) 121 d) 125 e) none of these

14. The sum of the squares of the lengths of three sides of a right triangle is 300. Find the length of the hypotenuse.

- a) $\sqrt{120}$ b) $\sqrt{130}$ c) 50 d) $\sqrt{100}$ e) none of these

15. In the diagram below, $\angle BAC = 90^\circ$, $BE = BD$, and $CD = CF$. The measure of $\angle EDF$ is:



- a) 30° b) 45° c) 50° d) 60° e) none of these

16. A storeowner raises the price of everything in a store by 50%, then 4 weeks later the storeowner wishes to have a sale, so that everything in the store is reduced to the original price. What percent discount should the sale offer?

- a) 33 % b) $33\frac{1}{3}$ % c) 50 % d) $66\frac{2}{3}$ % e) none of these

17. Johnny has less than 6 dozen apples in his basket.

If he counts by 2's, there is only 1 left

If he counts by 3's, there are 2 left

If he counts by 4's, there are 3 left

If he counts by 5's there are 4 left

How many apples are there in his basket?

- a) 71 b) 48 c) 59 d) 24 e) none of these

18. If $\frac{x}{5} + \frac{3}{m} = \frac{1}{y}$, what is m in terms of x and y ?

- a) $\frac{15y}{5-xy}$ b) $\frac{5-xy}{3}$ c) 5 d) $x - y$ e) none of these

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19. Adding 2 years to the age of a boy would make him one quarter of his father's age. Four years ago, his father was one year less than ten times his son's age. How old is the boy?

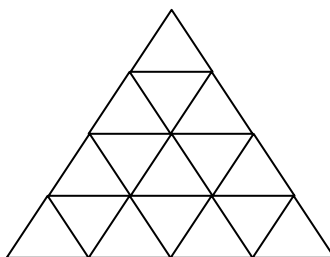
- a) 6 b) $7\frac{1}{2}$ c) 8 d) $8\frac{1}{2}$ e) 9

20. If $xy = 6$, $yz = 9$, and $zx = 24$, the value of xyz could be:

- a) 24 b) 36 c) 216 d) 648 e) 1296

Part C: (8 credits each)

21. What is the total number of triangles in the figure below?



- a) 22 b) 23 c) 24 d) 27 e) 47

22. From a 280 mL bottle, 80 mL of pop is removed and replaced with orange juice. Later 80 mL of the liquid in the bottle is again removed and replaced with orange juice. To the nearest mL, how much pop is left in the bottle?

- a) 120 b) 140 c) 143 d) 160 e) none of these

23. Sanjay can paint a room in 5 hours. However, it takes his brother 10 hours to do the same job. How long would it take them if they worked together?

- a) 15 hours b) 6 hours c) 3 hours d) 3 hrs 20 min. e) none of these

24. 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

25. Consider the sequence 6, 216, 225, 141, ... Each term is the sum of the cubes of the digits of the previous term. What is the value of the 50th term in the sequence?

- a) 370 b) 371 c) 407 d) 176 549 e) none of these