The CENTRE for EDUCATION
in MATHEMATICS and COMPUTING

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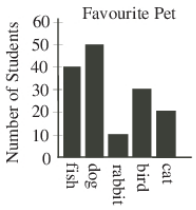
Gauss Contest Grade 7
Problems

1. The grade 7 students at Gauss Public School were asked, "What is your favourite pet?'' The number of students who chose fish is

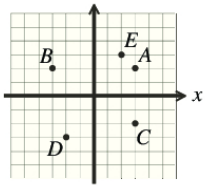


(A) 10 (B) 20 (C) 30 (D) 40 (E) 50

2. Tanya scored 20 out of 25 on her math quiz. What percent did she score?
(A) 75 (B) 95 (C) 80 (D) 20 (E) 45

3. The value of $4 \times 5 + 5 \times 4$ is
(A) 160 (B) 400 (C) 100 (D) 18 (E) 40

4. In the diagram, the point with coordinates $(-2, -3)$ is located at

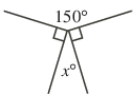


(A) A (B) B (C) C (D) D (E) E

5. Chaz gets on the elevator on the eleventh floor. The elevator goes down two floors, then stops. Then the elevator goes down four more floors and Chaz gets off the elevator. On what floor does Chaz get off the elevator?
(A) 7th floor (B) 9th floor (C) 4th floor (D) 5th floor (E) 6th floor

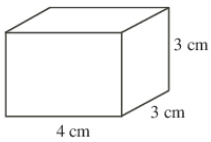
6. If $10.0003 \times \square = 10000.3$, the number that should replace the $\square$ is
(A) 100 (B) 1000 (C) 10000 (D) 0.001 (E) 0.0001

7. In the diagram, the value of x is



(A) 40 (B) 35 (C) 150 (D) 30 (E) 25

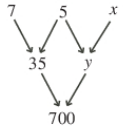
8. How many 1 cm $\times$ 1 cm $\times$ 1 cm blocks are needed to build the solid rectangular prism shown?



(A) 10 (B) 12 (C) 33 (D) 66 (E) 36

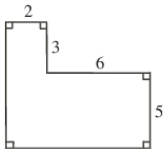
9. The time on a digital clock reads 3:33. What is the shortest length of time, in minutes, until all of the digits are again equal to each other?
(A) 71 (B) 60 (C) 142 (D) 222 (E) 111

10. Each number below the top row is the product of the number to the right and the number to the left in the row immediately above it. What is the value of x?



(A) 8 (B) 4 (C) 7 (D) 5 (E) 6

11. The area of the figure, in square units, is



(A) 36 (B) 64 (C) 46 (D) 58 (E) 32

12. Recycling 1 tonne of paper will save 24 trees. If 4 schools each recycle $\frac{3}{4}$ of a tonne of paper, then the total number of trees this will save is
(A) 24 (B) 72 (C) 18 (D) 126 (E) 80

13. If the mean (average) of five consecutive integers is 21, the smallest of the five integers is
(A) 17 (B) 21 (C) 1 (D) 18 (E) 19

14. A bag contains green mints and red mints only. If 75% of the mints are green, what is the ratio of the number of green mints to the number of red mints?
(A) 3 : 4 (B) 3 : 1 (C) 4 : 3 (D) 1 : 3 (E) 3 : 7

15. Square M has an area of 100 cm^2. The area of square N is four times the area of square M. The perimeter of square N is
(A) 160 cm (B) 400 cm (C) 80 cm (D) 40 cm (E) 200 cm

16. In a magic square, all rows, columns, and diagonals have the same sum. The magic square shown uses each of the integers from -6 to $+2$. What is the value of Y?

+1		Y
-4		
-3		-5

(A) -1 (B) 0 (C) -6 (D) $+2$ (E) -2

17. How many three-digit integers are exactly 17 more than a two-digit integer?
(A) 17 (B) 16 (C) 10 (D) 18 (E) 5

18. Distinct points are placed on a circle. Each pair of points is joined with a line segment. An example with 4 points and 6 line segments is shown. If 6 distinct points are placed on a circle, how many line segments would there be?

(A) 13 (B) 16 (C) 30 (D) 15 (E) 14

19. If each of the four numbers 3, 4, 6, and 7 replaces a $\square$, what is the largest possible sum of the fractions shown? $\frac{\square}{\square} + \frac{\square}{\square}$
(A) $\frac{19}{12}$ (B) $\frac{13}{7}$ (C) $\frac{5}{2}$ (D) $\frac{15}{4}$ (E) $\frac{23}{6}$

20. Andy, Jen, Sally, Mike, and Tom are sitting in a row of five seats. Andy is not beside Jen. Sally is beside Mike. Who *cannot* be sitting in the middle seat?

(A) Andy (B) Jen (C) Sally (D) Mike (E) Tom

21. A bicycle travels at a constant speed of 15 km/h. A bus starts 195 km behind the bicycle and catches up to the bicycle in 3 hours. What is the average speed of the bus in km/h?
(A) 65 (B) 80 (C) 70 (D) 60 (E) 50

22. In the *Coin Game*, you toss three coins at the same time. You win only if the 3 coins are all showing heads, or if the 3 coins are all showing tails. If you play the game once only, what is the probability of winning?
(A) $\frac{1}{6}$ (B) $\frac{1}{4}$ (C) $\frac{2}{27}$ (D) $\frac{2}{3}$ (E) $\frac{1}{3}$

23. Molly assigns every letter of the alphabet a *different* whole number value. She finds the value of a word by *multiplying* the values of its letters together. For example, if D has a value of 10, and I has a value of 8, then the word DID has a value of $10 \times 8 \times 10 = 800$. The table shows the value of some words. What is the value of the word MATH?

Word	Value
$TOTE$	18
$TEAM$	168
MOM	49
$HOME$	70
$MATH$	?

(A) 19 (B) 840 (C) 420 (D) 190 (E) 84

24. How many different pairs (m, n) can be formed using numbers from the list of integers $\{1, 2, 3, \ldots, 20\}$ such that $m
25. 55
26. 90
27. 140
28. 110
29. 50

25. Tanner wants to fill his swimming pool using two hoses, each of which sprays water at a constant rate. Hose A fills the pool in a hours when used by itself, where a is a positive integer. Hose B fills the pool in b hours when used by itself, where b is a positive integer. When used together, Hose A and Hose B fill the pool in 6 hours. How many different possible values are there for a?
(A) 5 (B) 6 (C) 9 (D) 10 (E) 12