PIMS Elementary Grades Math Competition
30 April 2016
Sprint Round - Grade Seven Division

NAME: _____

SCHOOL: _____

1. What is the perimeter of a rectangle with sides 5 and 7? _____ 1

2. What is the smallest prime whose digit sum is 4? _____ 2

3. You throw one fair die. What is the probability of not getting the number 1?
Express your answer as a fraction in lowest terms. _____ 3

4. What is the decimal representation of $\frac{3}{8}$ correct to 3 decimal places? _____ 4

5. Calculate: $2^4+0+1^3+6^2=$ _____ 5

6. Consider the following sequence: $1,2,3,1,2,3,1,2,3,\ldots$
What is the sum of the first 20 terms? _____ 6

7. Round 19% of 19 to the nearest integer. _____ 7

8. There were 3 yellow jelly beans and 3 red jelly beans in a bag.
Tom picked two of the jelly beans at random and ate them.
What is the probability that Tom ate two red jelly beans?
Express your answer as a fraction in lowest terms. _____ 8

9. It took Dave an average of 150 seconds/question to answer the 12 questions of the math contest. How many minutes did it take him in total to answer all 12 questions of the contest? _____ (m) 9

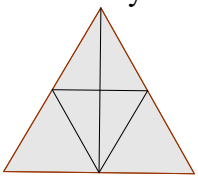
10. A rectangle has area 35 and perimeter 24. What is the value of its largest side? _____ 10

11. When ice melts, its volume shrinks by $\frac{1}{11}$ (the new volume is $\frac{10}{11}$ of the original volume). When water freezes, by how many percent does the volume increase? _____ (%) 11

12. What is the value of $31^2 - 29^2$? _____ 12

13. A photocopier has four buttons to zoom a document to 200%, 125%, 100%, and 10% of its original size, but the 100% button is broken. Using the three working buttons, what is the minimum number of times that you need to copy a document to produce a copy at its original size? _____ 13

14. Triangles that look equilateral are equilateral. How many triangles are there in the diagram?



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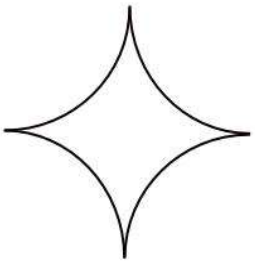
15. The sum of 2 numbers is 15 and their product is 5. What is the sum of their reciprocals? _____ 15

16. The denominator of a fraction is 10 greater than its numerator. If the numerator and denominator are both increased by 15, the fraction becomes $\frac{14}{19}$ after reduction to lowest terms. What is the original fraction? _____ 16

17. Emma needs 6 hours to type a report and Fred needs 10 hours to type the same report. Emma typed a portion of the report for a few hours. Then, Frank finished typing the report. They, together, worked a total of 7 hours. How many hours did Emma work on this report? Provide your answer as a fraction in lowest terms. _____ (h) 17

18. The figure below consists of 4 quarter circles of radius 2. What area is enclosed in the figure rounded to the nearest whole number?



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Grade Seven (7) Division

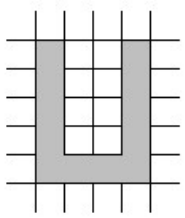
19. If a car dealership gives a 5% discount on a car, the dealership will make a $5250 profit on the car. If, instead it will give a 25% discount, the dealership will lose $1750. How much did the dealership pay for the car (in dollars)? _____ ($) 19

20. What is the sum of the average of all positive double digit numbers and the average of all positive 3-digit numbers? _____ 20

21. Four married couples meet at a party and decide to dance so that they will all dance at the same time but no husband is allowed to dance with his own wife. In how many different ways can it be done? _____ 21

22. When the swimming pool is 25% full, it takes 2250 cubic metres (m^3) to fill it up from that point. When it is full, it can be emptied at a rate of $120\frac{m^3}{h}$. How many hours does it take to empty an 80% full pool? _____ (h) 22

23. The figure below shows a $600m \times 700m$ park with 22 entry gates spaced at 100 metres apart (the end points of the lines). Harry chooses one entry gate at random and keeps walking straight until he reaches the perimeter of the grass region (the U shape shaded region). What is the average distance that Harry has to walk in metres (rounded to the nearest whole metre)?



_____ (m) 23

24. In how many ways can 6 people, including Ben and Jerry, be seated in a row, if Ben and Jerry must sit next to each other? _____ 24

25. $N > 0$ satisfies that $\frac{N}{7}$ is a perfect cube and $N \times 2016$ is a perfect square. What is the smallest possible value of N ? _____ 25

26. All angles of a convex polygon are smaller than 180 degrees. The measures (in degrees) of 4 of the angles of a convex pentagon are N , $2N$, $3N$, and $4N$, where N is an integer. If M is the measure of the fifth angle, and if it satisfies $2M = KN$, where K is a whole number, what is the value of M (in degrees)? _____ (°) 26