

SA Mathematics Challenge 2016

Grade 6 Final Round

27 July 2016

NOTE:

- Answer the questions according to the instructions on the answer sheet.
- You may use a calculator.
- The questions test insight. Complex calculations will therefore not be necessary.
- We hope you enjoy it!

1. There are 150 students at a school meeting. If $\frac{1}{3}$ of them are boys, how many girls are there at the meeting?

- (A) 45 (B) 50 (C) 100 (D) 105 (E) 115

2. The time is now 22:22. How many minutes are there until midnight?

- (A) 178 (B) 138 (C) 128 (D) 108 (E) 98

3. I am thinking of two numbers. When I add them I get 33. When I subtract the one from the other I get 3. What is the value of the larger number?

- (A) 12 (B) 15 (C) 16 (D) 18 (E) 20

4. At a certain point in a race, John is 2 m ahead of Rashied while Rashied is 8 m behind Luthando. What is the distance between Luthando and John?

- (A) 4 m (B) 10 m (C) 6 m (D) 2 m (E) 16 m

5. How many 3s are needed to number all the houses in a street with houses numbered from 1 to 130?

- (A) 24 (B) 23 (C) 22 (D) 21 (E) 20
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6. If each \square in this number expression is replaced by either + or \times , what is the biggest possible value of the expression?

$$1 \square 8 \square 5 \square 3$$

- (A) 23 (B) 17 (C) 120 (D) 135 (E) 121

7. The product of two consecutive multiples of 4 is 3840. What is the sum of the multiples?

- (A) 116 (B) 64 (C) 124 (D) 88 (E) 412

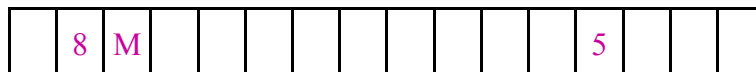
8. The difference between $\frac{1}{3}$ of a certain number and $\frac{1}{5}$ of the same number is 3. What is that number?

- (A) 15 (B) 22,5 (C) 45 (D) 60 (E) 75,5

9. Steven rolls an ordinary six-sided die repeatedly, keeping track of each number as he rolls, and stopping as soon as any number is rolled for the fifth time. Steven stops after his seventh roll, and the sum of the numbers he rolled is 17. How many different combinations of numbers could he have rolled? (The order does not matter.)

- (A) 3 (B) 4 (C) 5 (D) 6 (E) 7

10. The sum of the three numbers in any three consecutive blocks below is 17. What is the value M?

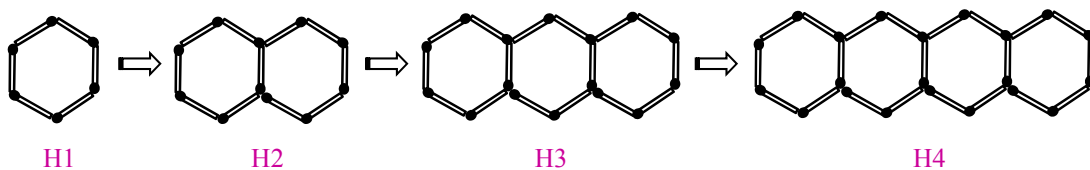


- (A) 5 (B) 9 (C) 4 (D) 6 (E) Not enough information

11. The sum of two whole numbers is 13. Which of the numbers below is not a possible product of these two numbers?

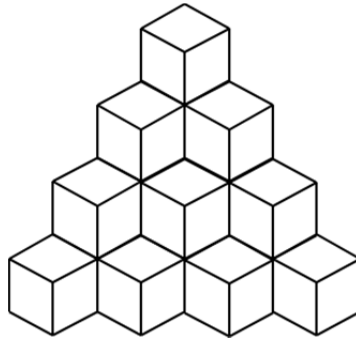
- (A) 42 (B) 40 (C) 38 (D) 36 (E) 30

12. Thobeka builds hexagon patterns with matches as shown below. How many matches does she need to build H21?



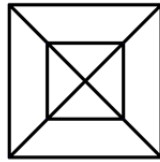
- (A) 106 (B) 112 (C) 126 (D) 92 (E) 118

13. This tower is four cubes high, and is built with 20 small cubes. How many cubes are required to build a similar tower that is five cubes high?



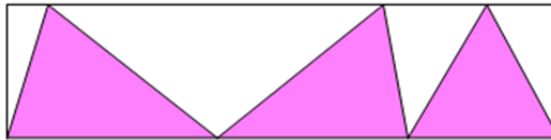
- (A) 25 (B) 35 (C) 27 (D) 30 (E) 45

14. How many triangles of any size are there in this diagram?



- (A) 16 (B) 14 (C) 12 (D) 11 (E) 8

15. What fraction of this rectangle is shaded?



- (A) $\frac{1}{2}$ (B) $\frac{1}{4}$ (C) $\frac{1}{3}$ (D) $\frac{2}{5}$ (E) $\frac{3}{7}$

16. My age is a multiple of five. In one year's time my age will be a multiple of two. I am older than 40 but younger than 60 years old. Three years ago my age was a multiple of three. How old will I be in four years' time?

- (A) 45 (B) 44 (C) 49 (D) 51 (E) 59

17. In this alpha puzzle, each letter stands for a unique digit so that the calculation is correct.

What is the value of $O + A + H$?

$$\begin{array}{r}
 O H \\
 O H \\
 + O H \\
 \hline
 A A H \\
 \hline
 \end{array}$$

- (A) 9 (B) 14 (C) 10 (D) 15 (E) 17

18. In the magic square below, the sum of the three numbers in each row, column and diagonal is the same. What number does ψ represent?

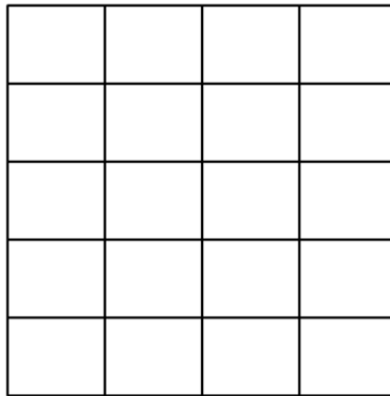
24		12
30	15	ψ

- (A) 18 (B) 25 (C) 21 (D) 19 (E) Not enough information

19. If a jug of water is $\frac{3}{4}$ full, it has a mass of 740 g. If some water is poured out so that the jug is only half full, it has a mass of 560 g. What is the mass of the empty jug?

- (A) 1300 g (B) 180 g (C) 555 g (D) 200 g (E) 280 g

20. Equal lengths of iron rods are used to make a square gate like below. The iron rods cross each other to form 20 identical small rectangles. The total length of iron used is 88 m. What is the length of iron rod used to make one small rectangle?



- (A) 4,4 m (B) 11 m (C) 6,6 m (D) 8 m (E) 7,2 m