

SA Mathematics Challenge 2016

Grade 7 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. Which of these expressions has the largest value?

(A) $6 \div \frac{1}{4}$ (B) $7 \div \frac{1}{3}$ (C) $3 \div \frac{1}{8}$ (D) $9 \div \frac{1}{2}$ (E) $5 \div \frac{1}{5}$

2. In a class of 30 learners, 21 take French as subject, 10 take Xhosa and two take neither. How many learners take French and Xhosa?

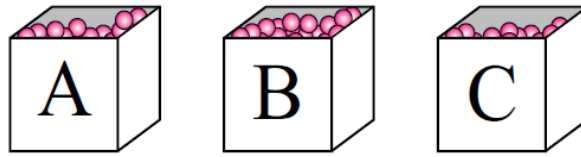
(A) 2 (B) 3 (C) 4 (D) 5 (E) 6

3. Paula the painter had just enough paint to paint 30 identically sized rooms. Unfortunately, on the way to work, three cans of paint fell off her truck, so she had only enough paint for 25 rooms. How many cans of paint did she use for the 25 rooms?



(A) 10 (B) 12 (C) 15 (D) 18 (E) 25

4. Box A contains 142 marbles, box B contains 152 marbles and box C contains 136 marbles. Marbles are transferred only from box B to box C. What is the least number of marbles that must be transferred so that box C contains more marbles than each of the other two boxes?



- (A) 6 (B) 7 (C) 8 (D) 9 (E) 16

5. What is the angle between the hour hand and the minute hand of a clock at 13:30?

- (A) 100° (B) 120° (C) 135° (D) 150° (E) 170°

6. Cindy was asked by her teacher to subtract 3 from a certain number and then divide the result by 9. Instead, she subtracted 9 and then divided the result by 3, giving an answer of 43. What would her answer have been had she worked the problem correctly?

- (A) 11 (B) 12 (C) 13 (D) 14 (E) 15

7. Kevin has two older twin brothers. The product of their three ages is 128. What is the sum of their three ages?

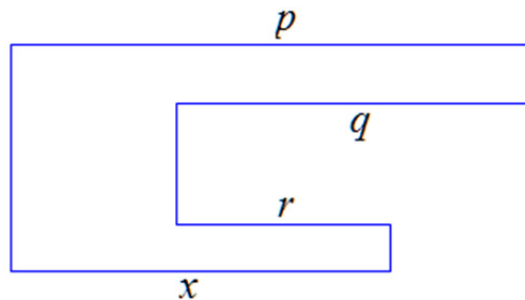
- (A) 10 (B) 12 (C) 16 (D) 18 (E) 24

8. A 12-hour digital clock displays hours and minutes. What is the largest possible sum of the digits in the display?

- (A) 16 (B) 17 (C) 23 (D) 24 (E) 27

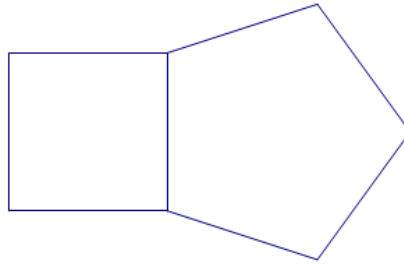
9. In this figure, all the angles which look like right angles are right angles.

Which expression gives the length of the side marked x ?



- (A) $p - q - r$ (B) $p - q + r$ (C) $p + q - r$ (D) $p + q + r$ (E) $q + r - p$

10. The diagram shows a square and a regular pentagon. The area of the square in square centimetres is equal to the perimeter of the pentagon in centimetres. How long is one side of the square?



- (A) 3 cm (B) 4 cm (C) 5 cm (D) 6 cm (E) 8 cm

11. A bus company has 36-seater buses and 12-seater buses (36 and 12 are the number of passengers). A school needs to transport 240 learners. What is the smallest number of buses needed if there are to be no spare seats?

- (A) 8 (B) 10 (C) 12 (D) 14 (E) 16

12. A three-digit number is formed by putting a 1 between the digits of a two-digit number. If the three-digit number is 9 times as big as the two-digit number, what was the original two-digit number?

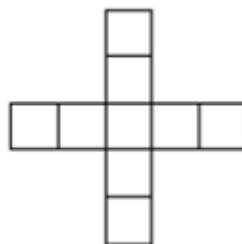
- (A) 75 (B) 42 (C) 53 (D) 64 (E) 35

13. Forty-eight identical coins are arranged in six piles, all of different heights. What is the smallest number of coins that there can be in the largest pile?



- (A) 11 (B) 12 (C) 13 (D) 14 (E) 15

14. Declan put each of the numbers 1 to 9 into the squares of this diagram. The total of the numbers in one direction was 15, and the total in the other direction was 34. Which number did Declan put in the centre square?



- (A) 1 (B) 2 (C) 3 (D) 4 (E) 5

15. In the expression $a \times b^c + d$, the values of a, b, c and d are 1, 2, 3 and 4, although not necessarily in that order. What is the maximum possible value of the expression?

- (A) 129 (B) 145 (C) 163 (D) 513 (E) 1297
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16. What number is one-third of the way from $\frac{1}{4}$ to $\frac{3}{4}$?

- (A) $\frac{1}{3}$ (B) $\frac{2}{3}$ (C) $\frac{1}{2}$ (D) $\frac{7}{12}$ (E) $\frac{5}{12}$
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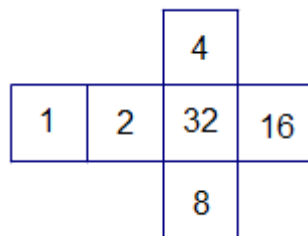
17. Each number in the sequence 13, 9, 18, ... is the sum of three times the tens digit plus two times the units digit of the previous number. What is the biggest number in this sequence?

- (A) 18 (B) 21 (C) 16 (D) 29 (E) greater than 29
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18. The digits 2, 4, 6 and 8 are used to make a four-digit number, using each digit once. If the digits can be used in any order, how many of these four-digit numbers will be divisible by 6?

- (A) 0 (B) 4 (C) 6 (D) 8 (E) 12
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19. Three cubes are each formed from the net shown. The three cubes are then stacked on a table one on top of another so that the 13 visible numbers have the greatest possible sum. What is this sum?



- (A) 154 (B) 159 (C) 164 (D) 167 (E) 189
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20. Anne is running around a circular track, completing each lap in 40 seconds. Brenda starts in the same place and at the same time as Anne, but runs in the opposite direction and meets Anne after 15 seconds. How long (in seconds) does it take Brenda to complete one lap around the track?

- (A) 20 (B) 24 (C) 28 (D) 30 (E) 25
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