

Primary Mathematics Challenge Bonus Paper

3 February 2016

Name Class

Please do **not** start to answer questions until you are told to do so. When you do turn over the page you will have 45 minutes for the challenge.

You must do all the work on your own. You should use rough paper for your working out.

Write down A B C D or E in the space for each answer. When you have finished, **use a B or an HB pencil** to copy your answers onto the OMR sheet, which will be sent in for marking.

You will get one mark for each correct answer.

Practice Questions

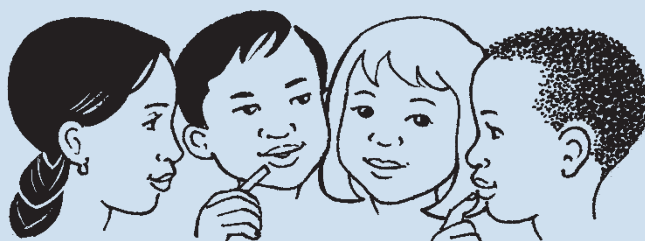
1 I multiply a whole number by 3.
Which of the following could be my answer?

A 325 B 326 C 327 D 328 E 329

2 How many of these calculations give the answer 2 ?

$\frac{1}{2} \times 2$ $4 \div 2$ $1 \div 2$ $\frac{1}{2} \times 4$ $2 \div 1$

A 1 B 2 C 3 D 4 E 5



Primary Mathematics Challenge Bonus Paper 2016

1 When 2016 is multiplied by 1000, how many digits does the answer have?

A 4 B 5 C 6 D 7 E 8






2 In a survey of 20 children, 8 had 1 brother, and 6 had 2 brothers. The mean number of brothers was 1. How many children had no brothers?

A 0 B 2 C 4 D 6 E 8

3 Which of the following calculations gives the largest remainder?

A $443 \div 4$ B $554 \div 5$ C $665 \div 6$ D $776 \div 7$ E $887 \div 8$

4 Four of these five shapes are reflections or rotations (or both) of each other. Which shape is not?

A  B  C  D  E 

5 In 1975 it was estimated that there were 250 000 lions in Africa. Over 40 years this figure has decreased by 90%. What is the current estimate for the number of lions in Africa?


A 25 000 B 100 000 C 160 000 D 225 000 E 275 000

6 One of the following statements is true. Which one?


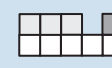
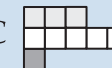
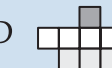

A One of these statements is false. B Two of these statements are false.
 C Three of these statements are false. D Four of these statements are false.
 E All of these statements are false.

7 A seagull travelled 16 500 miles from Finland to Australia. It travelled at a rate of 125 miles a day. For approximately how many days had it been travelling?

A 130 B 140 C 150 D 160 E 170



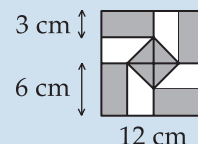
8 Each of the shapes below is made from 9 identically-sized squares. Which one of the shapes has a different perimeter from the other four?

A  B  C  D  E 

9 What is the value of $\frac{\frac{2}{3} + \frac{1}{3}}{\frac{2}{3} - \frac{1}{3}}$?

A $\frac{1}{2}$ B $\frac{1}{3}$ C 1 D 3 E 6

10 This patchwork design has rotational symmetry of order 4. What is the total area of the shaded sections?



- A 72 cm^2 B 90 cm^2 C 108 cm^2 D 120 cm^2 E 144 cm^2

11 What is the value of $\frac{66+77+88+99}{11+22+33+44}$?

- A 2.5 B 3 C 3.5 D 4 E 4.5

12 Patrick wondered if when you add had two multiples of 4, you **always** get a multiple of 8. Which of the following sums shows this idea is wrong?

- A $202 + 202$ B $432 + 324$ C $543 + 345$ D $204 + 402$ E $408 + 408$

13 In *Munchem Café* there are 5 items for sale. Prices for some combinations of them are shown here. How much would it cost to buy a plate with one of each of the 5 items: beans, tomatoes, egg, mushrooms and sausage?

| | |
|---------------------------|-------|
| Beans & tomatoes | £2.50 |
| Tomatoes & egg | £3.00 |
| Egg & mushrooms | £3.50 |
| Mushrooms & sausage | £4.00 |
| Sausage & beans | £5.00 |

- A £8 B £9 C £10 D £11 E £12

14 If 6 fly-eating chameleons can eat eight flies in 4 minutes, how many flies can 8 fly-eating chameleons eat in 6 minutes?

- A 8 B 12 C 16 D 20 E 24



15 What is the acute angle between the hands of a clock at 6.30 pm?

- A 0° B 5° C 10° D 12.5° E 15°

16 It is well-known that Martians each have 7 arms and 3 legs. When some two-armed and two-legged humans went to visit Mars, there were altogether 91 arms and 47 legs. How many more Martians than humans were there?

- A 1 B 2 C 3 D 4 E 5

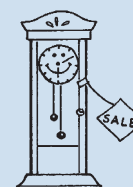


17 I fold an equilateral triangle so that one corner touches the middle of the opposite edge. What is the ratio of the perimeter of the triangle to the perimeter of the resulting trapezium?

- A 1 : 1 B 6 : 5 C 4 : 3 D 3 : 2 E 2 : 1

18 A grandfather clock was on sale last month for £10 800, but this month its price has been reduced to £8640. What percentage discount is this?

- A 10% B $12\frac{1}{2}\%$ C 15% D 20% E 25%



19 *Mad Teacher Disease* is spreading. Each week it spreads from teacher to teacher, shown as the dots in the pentagonal diagrams on the right. How many teachers will be affected by week 9?

| | | | | | | |
|------|---|---|---|---|---|----------------------|
| Week | 1 | 2 | 3 | 4 | 5 | <input type="text"/> |
|------|---|---|---|---|---|----------------------|

| | | | | | | |
|------------------------|---|---|----|----|----|--|
| number of Mad Teachers | 1 | 5 | 12 | 22 | 35 | |
|------------------------|---|---|----|----|----|--|

A 115 B 116 C 117 D 118 E 119

20 Squirrel Nutcase has gathered 100 nuts. She eats some of them and then she finds she can divide what is left into piles of 2, or piles of 3 nuts, or piles of 5 nuts, each time with one nut left over. When she divides the nuts into piles of 7 each, she has no left over nuts. How many nuts did Squirrel Nutcase eat?

A 2 B 5 C 9 D 13 E 16

21 The diagram shows a plastic box without a lid. Its outside dimensions are as shown, and the plastic is 1 cm in thickness. What volume of plastic is needed to make this box?

A 120 cm³ B 160 cm³ C 200 cm³ D 240 cm³ E 360 cm³

22 If you were to work out the answer to the sum $2^{2016} + 0^{2016} + 1^{2016} + 6^{2016}$ you would get a number with 1569 digits, starting with 566 136 001 ... What is the last digit of this number?

A 1 B 3 C 5 D 7 E 9

23 In the diagram the parallelogram PQRS is made from the two isosceles triangles PSQ and RQS. The three lines RQ, QS and SP are the same length. What is the angle marked x?

A 67° B 68° C 69° D 70° E 71°

24 The sum of the ages of four children Anil, Benu, Chas and Dave is 20. Dave is 5 years older than Chas, and 3 years older than Benu. Anil is 3 years younger than Chas. How old is Anil?

A 1 B 4 C 5 D 6 E 9

25 Oscar has a list of 41 consecutive numbers. The sum of all of the even numbers in his list is 2016. What is the sum of **all** of the numbers in his list?

A 3886 B 3896 C 3916 D 3926 E 3936