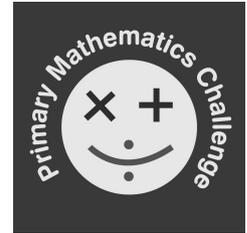


Primary Mathematics Challenge Bonus Paper



2 February 2022

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 answer onto the machine-readable sheet, which will be sent in for marking.

Each correct answer gains one mark.

Practice Questions

P1 Dee Jay's favourite song is 2 minutes and 30 seconds long.

What is the greatest number of times he can listen to it during a 10-minute car journey?

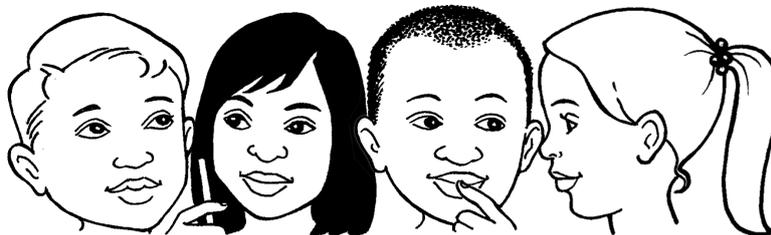
A 1 B 2 C 3 D 4 E 5

P2 Euros are used in many European countries.

Calculate $€5.20 + €7.10$.

Bienvenue en France

A €12.00 B €12.10 C €12.30 D €14.00 E €14.30



MATHEMATICAL ASSOCIATION



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1. Vegan Val is cooking for 8 people.
Each person will be given 6 sprouts.
How many sprouts does she need?



- A 6 B 8 C 24 D 32 E 48

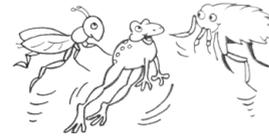
2. A shop sells striped, spotty and plain shirts which are all available in small, medium and large sizes, each on their own hanger.
One of each type is put out on display.



How many coat hangers are needed to do this?

- A 6 B 7 C 8 D 9 E 10

3. A flea can jump 32 cm, a grasshopper can jump 100 cm and a frog can jump 150 cm.



What is the mean of these distances?

- A 32 cm B 94 cm C 100 cm
D 150 cm E 282 cm

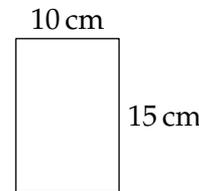
4. Information from a spacecraft on Mars takes about three hours to travel to NASA headquarters on Earth. Mars is about 171 million miles away.



At how many million miles an hour is this information travelling?

- A 57 B 60 C 86 D 120 E 172

5. A photo measuring 10 cm × 15 cm is enlarged so that the image is similar but bigger.
The width of the larger photo is 20 cm.



What is the height of the enlarged photograph?

- A 10 cm B 15 cm C 20 cm D 25 cm E 30 cm

6. What is the difference between the largest one-digit multiple of 3 and the smallest two-digit multiple of 3?

- A 1 B 2 C 3 D 4 E 5

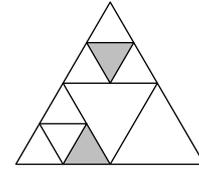
7. Roya hits four out of five cricket balls bowled to her.
Khalida hits three out of four balls bowled to her.
Each girl is bowled 20 balls.



What happens?

- A Roya hits one more ball than Khalida
- B Khalida hits one more ball than Roya
- C Roya hits four more balls than Khalida
- D Khalida hits five less balls than Roya
- E They both hit the same number of balls

8. In this diagram the small equilateral triangles are all the same size.



What fraction of the largest equilateral triangle is shaded grey?

- A $\frac{1}{5}$
- B $\frac{1}{6}$
- C $\frac{1}{7}$
- D $\frac{1}{8}$
- E $\frac{1}{9}$

9. Sandy made a cake and kept $\frac{1}{4}$ of it for herself.
She gave the rest to Katie, Richard, Mo, Mim, Max and Maisie to share equally between the six of them.

How much of the original cake did Mo get?

- A $\frac{1}{8}$
- B $\frac{1}{4}$
- C $\frac{1}{3}$
- D $\frac{3}{8}$
- E $\frac{3}{4}$

10. I have two *congruent right-angled isosceles* triangles.
(*Congruent* means they are identical in shape and size.)

Which of the following shapes can never be made with these triangles when they are placed side by side to make new shapes?

- A square
- B isosceles triangle
- C rhombus
- D equilateral triangle
- E hexagon

11. Philla Bucket was measuring the water wasted by a dripping tap over a week.
She noticed that over the weekend it leaked 250 ml and that on each weekday it leaked 100 ml.



How many litres of water were wasted over the week?

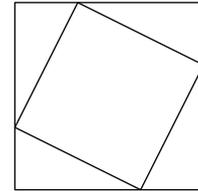
- A 0.5
- B 0.75
- C 1
- D 1.5
- E 1.8

12. When I was 14 years old, my mother was 38.
She is now twice as old as me.
How old am I now?

A 20 B 22 C 24 D 26 E 28



13. The diagram shows two squares.
The smaller square just touches the larger square
one third of the way along each side of the larger
square. The larger square has sides of 12 cm.



What is the area of the smaller square?

A 24 cm^2 B 60 cm^2 C 64 cm^2 D 80 cm^2 E 100 cm^2

14. Yazeed is playing around with lots of 4s, trying to make totals of 4.

Which calculation doesn't give a total of 4?

A $\frac{4+4}{4} + \frac{4+4}{4}$ B $\frac{4 \times 4 \times 4}{4 \times 4}$ C $4 \times 4 \div 4$
D $\frac{4^4}{4^3}$ E $\frac{44+44}{44}$

15. Gregory Growmore has dug up all of his potatoes,
carrots and onions.
It turns out that he has twice as many potatoes as
carrots, and twice as many carrots as onions.
In total, he has 84 vegetables.

How many onions does he have?

A 8 B 10 C 12 D 14 E 42



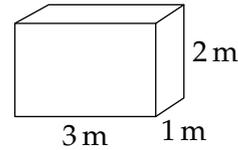
16. A poor computer translation programme loses
20% of meaning with each translation.

Math_εm@11c\$

How much meaning will be left after two translations?

A 20% B 40% C 50% D 64% E 80%

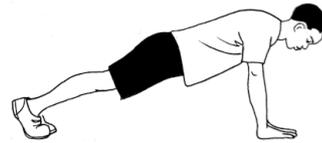
17. A metal open-topped water tank for a village is 3 m long, 1 m wide and 2 m high. It will have a plastic cover.



What area of metal is used to make this tank?

- A 6 m^2 B 9 m^2 C 12 m^2
 D 19 m^2 E 22 m^2

18. On the first day I do a press-up.
 On the second day I do three press-ups.
 On the third day I do five press-ups, and so on up to day n .

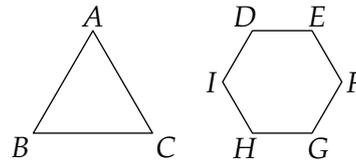


Which formula tells me how many press-ups I will do on day n ?

- A $n - 1$ B n C $2n - 1$ D $2n$ E $2n + 1$

19. The equilateral triangle ABC has the same perimeter as regular hexagon $DEFGHI$.

What is the ratio of the area of triangle ABC compared to the area of the hexagon $DEFGHI$?



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

20. The minute hand on Big Ben is about 4.3 metres long. Every hour the tip of the minute hand traces out a circular path which is just over 27 metres long.

Approximately how far does it travel in one year?

- A 10 000 m B 12 km C 24 km
 D 100 km E 240 km



21. Jenny Jackson has 20 friends. 18 would like to help in a charity shop, 14 would like to help young children with their reading, and 10 would like to help with animals.

What is the largest possible number of her friends that would not like to do any of these?

- A 1 B 2 C 3 D 4 E 6

22. Joe likes sharpening pencils!

It takes him 2 hours and 20 minutes to sharpen a box of 144 pencils.

The next day, Joe (working at the same rate) is helped by Josie. Together they take exactly one hour to sharpen another box of 144 pencils.

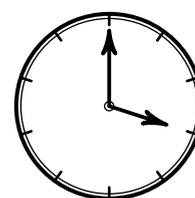
How long would it take Josie, working at her rate, to sharpen 144 pencils on her own?



- A 1 hour 10 minutes B 1 hour 12 mins C 1 hour 36 mins
 D 1 hour 45 mins E 2 hours

23. For 13 years in the eighteenth century, France had 10 hours in a complete day, from midnight to midnight and 100 minutes in each hour.

What time would this 10-hour clock tell us in our day of 24 hours?

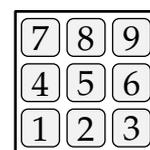


- A 3 a.m. B 4 a.m. C 5.30 a.m.
 D 7.12 a.m. E 8 a.m.

24. Li Wei is looking at the numbers 1 – 9 on his calculator, which are arranged as shown.

He realises that he can find 16 different three digit numbers by reading in straight lines horizontally, vertically and diagonally both forwards and backwards!

How many of these numbers are prime?



- A 0 B 1 C 3 D 6 E 9

25. International Standard Book Numbers are given to each new book which is published. If the sum of the 2nd, 4th, 6th, 8th, 10th and 12th digits is tripled and then added to the remaining digits (1st, 3rd, 5th, 7th, 9th, 11th and 13th), the total will always be divisible by 10.



So, in this case, $3 \times (7 + 3 + 6 + 4 + 4 + 0) + (9 + 8 + 1 + 1 + 8 + 1 + 0) = 72 + 28 = 100$.

In the ISBN on the right, the 12th digit is hard to read: 978-0-90-65889?-7

What is the 12th digit?

- A 0 B 1 C 2 D 6 E 8