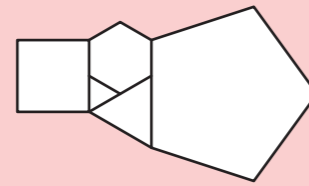


19. On a map of England and Wales the distance between St Ives in Cornwall and St Ives in Cambridgeshire measures 18 cm. In reality the distance between the two towns is about 450 km.

Which of the options below is the scale of the map?

- A 1 : 2 500 000 B 1 : 1 000 000 C 1 : 750 000 D 1 : 500 000
E 1 : 250 000

20. The diagram on the right shows a shape made of two equilateral triangles, a square, a regular pentagon and a regular hexagon. The perimeter of the square is 24 cm.



What is the perimeter of the whole shape?

- A 54 cm B 57 cm C 60 cm D 63 cm E 66 cm

21. All of the 24 healthy children in my class eat at least one type of fruit. Half of them eat oranges, a third eat apples and a quarter eat pears.

What is the largest possible number of children who eat only one kind of these fruits?

- A 12 B 14 C 22 D 23 E 24

22. There are 24 four-digit numbers which use each of the digits 3, 5, 6 and 9 once only.

When all of these 24 four-digit numbers are put in order from smallest to largest, which one is in *eight*th position?

- A 3569 B 5369 C 5396 D 5639 E 5936

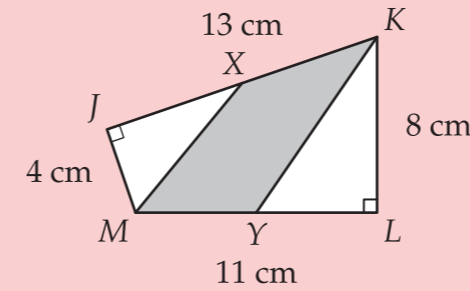
23. In the diagrams, $\frac{4}{5}$ of the shape P is shaded and $\frac{5}{7}$ of shape Q is shaded.



What fraction of shape R is shaded?

- A $\frac{3}{5}$ B $\frac{3}{7}$ C $\frac{16}{35}$ D $\frac{19}{35}$ E $\frac{33}{35}$

24. The quadrilateral $JKLM$ on the right has sides of 4 cm, 8 cm, 11 cm and 13 cm, and right angles at J and L . The points X and Y are the midpoints of JK and LM . Lines have been drawn to form the shaded quadrilateral $XKYM$.



What is the area of quadrilateral $XKYM$?

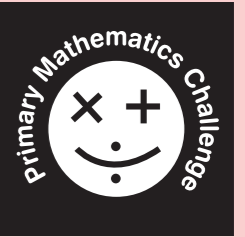
- A 28 cm² B 32 cm² C 35 cm²
D 37 cm² E 40 cm²

25. A bag contains 100 raffle tickets in red, white and blue. The ratio of red to white tickets is 5 : 4 and the ratio of white to blue tickets is 8 : 7.

What is the smallest number of tickets that would have to be picked to guarantee having selected at least half of **one** colour?

- A 48 B 49 C 50 D 51 E 52

Primary Mathematics Challenge Bonus Paper



7 February 2018

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.

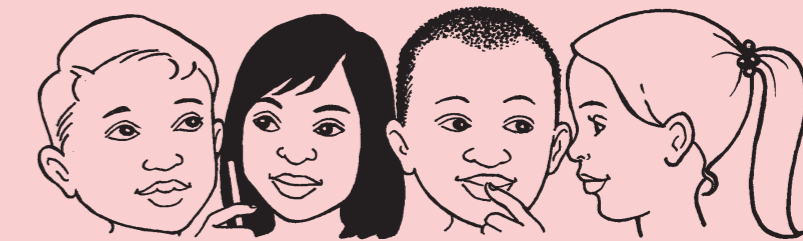
Practice Questions

P1 A regular pentagon has a perimeter of 30 cm.
How long is each side?

- A 4 cm B 5 cm C 6 cm D 7 cm E 8 cm

P2 Two thirds of a number is 12. What is the number?

- A 4 B 6 C 8 D 18 E 20



Please turn over ...



1. How many £2 coins have the same value as a £50 note?

- A 10 B 15 C 25 D 30 E 35

2. Which calculation has the greatest value?

- A $2 \times (0 + 1 + 8)$ B $2 - 0 - 1 - 8$ C $2 \times 0 \times 1 \times 8$
 D $2 + 0 + 1 + 8$ E $2 + (0 \times 1 \times 8)$

3. I start a book, read three-quarters of it at bedtime and read 22 more pages at breakfast. Now I have 35 pages left.



How many pages are there in the book?

- A 57 B 76 C 114 D 140 E 228

4. Jake can see 14 heads and 38 legs. What could he be looking at?

- A 8 geese and 6 sheep B 6 geese and 8 sheep
 C 9 geese and 5 sheep D 5 geese and 9 sheep
 E 10 geese and 4 sheep

5. Which one of the following statements is correct?

- A $\frac{15}{24} = \frac{1 \times 5}{2 \times 4}$ B $\frac{24}{35} = \frac{2 \times 4}{3 \times 5}$ C $\frac{33}{46} = \frac{3 \times 3}{4 \times 6}$ D $\frac{42}{57} = \frac{4 \times 2}{5 \times 7}$
 E $\frac{51}{68} = \frac{5 \times 1}{6 \times 8}$

6. Dr Whynot Jabbemall has to jab 300 patients in 30 minutes. In the first ten minutes he jabs at a rate of 6 per minute.



How many jabs per minute must he make in the next 20 minutes to complete his task?

- A 6 B 12 C 15 D 20 E 30

7. In which of the following ranges would you find a multiple of 91?

- A 1 to 60 B 101 to 160 C 201 to 260 D 301 to 360
 E 401 to 460

8. To download a single song costs 79p. However, 5 songs can be bought together for £3.50.

What is the maximum number of songs that Gethin can buy for £10?

- A 10 B 11 C 12 D 13 E 14

9. The sum of the first 10 positive integers is 55.

What is the sum of the next 10 integers?

- A 55 B 110 C 155 D 210 E 550

10. Mr Midas says that his daughter Audrey is worth her weight in gold.

If Audrey weighs 50 kg and gold costs £35 per gram, how much does her father think she is worth?



- A £17.50 B £1750 C £175 000 D £1 750 000
 E £17 500 000

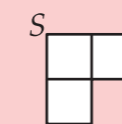
11. The menu for a café is shown. All five items – bacon, beans, egg, sausage, toast – cost the same, **except one** which costs twice as much as the others.

Menu	
Beans on toast	£1.20
Bacon, sausage and egg	£1.20
Egg on toast	80p
Toast, beans and sausage	£1.60

Which item costs more?

- A Bacon B Beans C Egg D Sausage E Toast

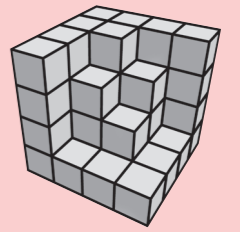
12. Asmita starts at corner S and runs at a constant speed clockwise around the outside of her L-shaped block of flats.



Which of the following graphs could show her distance from her starting point at S as she runs?

- A B C
 D E F

13. This solid ornament is made up entirely of golden cubes. A diamond is to be placed on each external face of every small cube, except on the base of the ornament.



How many diamonds does the jeweller need to complete the ornament?

- A 30 B 48 C 60 D 75 E 80

14. If we let N mean the number of factors of the number N , then $4 = 3$, because 4 has 3 factors (namely 1, 2 and 4).

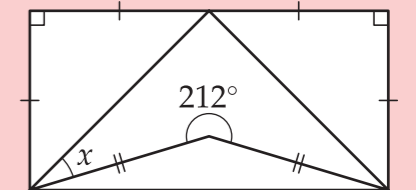
What is the value of



- A 3 B 6 C 8 D 9 E 11

15. What is the size of the angle marked x ?

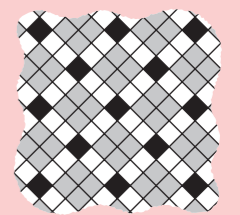
- A 25° B 26° C 27° D 28°
 E 29°



16. What is the time when it is 2018 minutes before midday on Wednesday?

- A 21:38 on Thursday B 02:22 on Tuesday
 C 14:52 on Tuesday D 11:38 on Wednesday
 E 20:18 on Monday

17. If you were tiling a very large wall with the pattern of small tiles shown on the right, in what ratio of black to grey to white tiles would you need to buy the tiles?



- A 1 : 4 : 2 B 1 : 4 : 4 C 1 : 4 : 8 D 1 : 2 : 1
 E 1 : 2 : 4

18. Sam's favourite number is 100 001; it is one less than a multiple of 7.

Which of the following numbers is one more than a multiple of 7?

- A 100 006 B 200 009 C 300 012 D 400 015 E 500 018