Primary Mathematics Challenge

18-22 November 2013
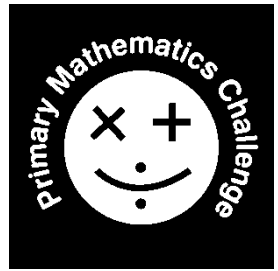
Name .... Class ....

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 this.

For questions 1 – 20, write down A B C D or E in the space for each answer.
For questions 21 – 25, write down your answer in the space.
Each correct answer gains one mark.
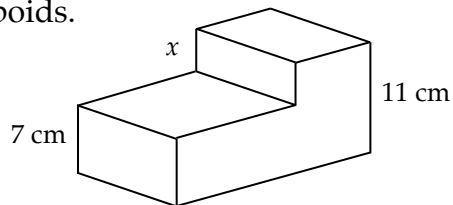
Good Luck. Enjoy the challenge!

Practice Questions

P1   In seven years' time, Alacoe will be 13 years old.
      How old was she last year?

      A 4   B 5   C 6   D 7   E 8

P2   The shape shown here is made of two cuboids.
      What is the length marked *x*?

      A 3.5 cm   B 4 cm   C 4.5 cm

      D 5 cm   E 5.5 cm

Total mark

/ 25

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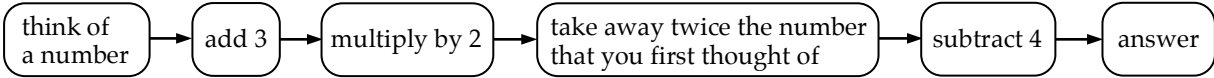
1 Which of these lengths is the longest?

    A 3.4 m   B 0.34 m   C 34 cm   D 3.4 cm   E 34 mm

2 I have 30 counters; some are red and the rest are blue.
There are twice as many red counters as there are blue counters.
How many red counters are there?

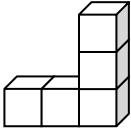   A 2   B 10   C 15   D 20   E 24

3 Bert starts his homework at 5.15 pm and finishes it at 6.05 pm.
During this time he has a break of 10 minutes.
How long does he spend working on his homework?

    A 35 min   B 40 min   C 45 min   D 50 min   E 1 hr

4 How many rectangles of different sizes can be seen here?

    A 2   B 3   C 4   D 5   E 6

5 A number has factors 2, 3 and 5. What is the smallest it can be?

    A 10   B 15   C 30   D 45   E 60

6 think of a number → add 3 → multiply by 2 → take away twice the number that you first thought of → subtract 4 → answer

What is the answer that this number machine always gives?

    A 1   B 2   C 3   D 4   E 5

7 A bouncy ball is dropped from a height of 160 cm. It bounces
twice and each time reaches three-quarters of its previous height.
How high does it rise on the second bounce?

    A 80 cm   B 90 cm   C 99 cm   D 108 cm   E 120 cm

8 Baby Finn is building a cube from individual smaller cube bricks.
How many more bricks does he need to make a 3 × 3 × 3 cube?

    A 4   B 10   C 16   D 22   E 28

9 I am having a bath. I wait for a minute, and then get out. I pull out the plug,
letting the water drain away. Which of the following graphs best shows the
depth of the water in the bath during this time?

    A   B   C   D   E
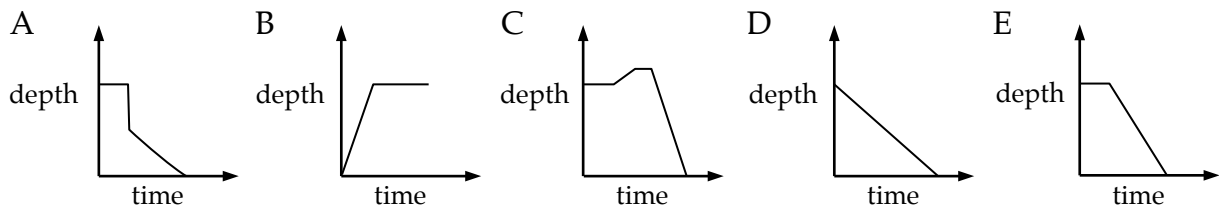
10 On its roof, a police car has a three-digit number divisible by 7. An albatross dropping has covered the last digit. What is the last digit?

A 4   B 5   C 6   D 7   E 8

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11 A sergeant stands too long in the sun and gets confused. His troops are lined up facing north. Then he gives the order to "Right Turn" 70 times, and his troops do so. In which direction are the troops facing at the end?

A north   B east   C south   D west   E west-south-west

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12 My local shop will make photocopies either for 10p per photocopy if I make fewer than 50 copies or for 7p per photocopy if I make 50 copies or more. I want to make 45 copies. How much would I save by making 50 copies instead?

A 70p   B 90p   C £1   D £1.20   E £1.30

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13 A security camera is placed in the corner of a square room and can detect burglars in the area shaded in the diagram. The two dashed lines from the corner go to the middle of each of the far sides. What fraction of the area of the room is the shaded area?

A $\dfrac{1}{4}$ B $\dfrac{3}{8}$ C $\dfrac{1}{2}$ D $\dfrac{5}{8}$ E $\dfrac{3}{4}$

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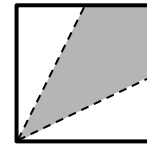
14 Polly Bagg lives in a small town of 500 people. Every day each person gets one polythene bag from the local shop. If all the people in the town decided to use their own bags instead, roughly how many bags would be saved in a year?

A 500   B 1800   C 18 000   D 180 000   E 1.8 million

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15 In 2011, a quarter of a million DVDs of *Doctor Why* were sold. In 2012, the number of sales increased by 10%. How many people bought a *Doctor Why* DVD in 2012?

A 25 000   B 27 500   C 250 000   D 275 000   E 2 750 000

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16 My name is Speedy. It takes me 3 minutes to cycle to school, which is half a mile away from my home. What is my average cycling speed?

A 4 mph   B 6 mph   C 8 mph   D 10 mph   E 12 mph

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17 Isobel is taller than Sarah. Emily is shorter than Isobel, but taller than Sarah. Alice is shorter than Rachel, but taller than both Emily and Isobel. Whose height is the middle for the group?

A Alice   B Emily   C Isobel   D Rachel   E Sarah

18   Each of the identical octagons in the diagram is 10 cm high and 10 cm wide, and has an area of 64 cm². What is the area of one of the shaded squares?

A 4 cm²   B 9 cm²   C 16 cm²

D 25 cm²   E 36 cm²

10 cm

10 cm
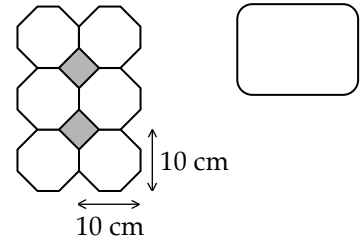
19   There are 18 chocolates in Swee Tuth's box, 2 each of 9 flavours. She likes only 6 of the flavours. If she picks a chocolate at random, what is the probability of her getting one she doesn't like?

A $\dfrac{2}{9}$ B $\dfrac{1}{3}$ C $\dfrac{4}{9}$ D $\dfrac{1}{2}$ E $\dfrac{2}{3}$

20   The diagram shows a tessellation of squares and equilateral triangles, which could go on forever. Approximately what percentage of the tessellation is covered with the equilateral triangles?

A 45%   B 55%   C 65%

D 75%   E 85%
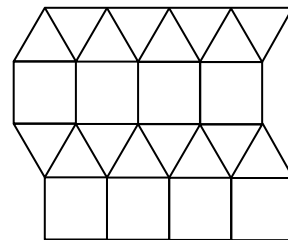
21   Willy Stockitt likes to display his tins of beans in just one large triangular pile. His shop window is 80 cm high and 42 cm wide, and his bean tins are 10 cm high and 5 cm wide. What is the largest number of tins he can display in his window?
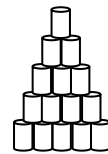
22   Tom is at 12 o'clock, and Jerry is at 6 o'clock. At the same time they both start to run clockwise, with Tom running one and a half times as fast as Jerry. At which number on the clock do they first meet?

23   I have a wooden cube whose sides measure 10 cm. I paint it all over, and then cut it up into 1000 cubes each of volume 1 cm³. How many of these cubes are painted on one face only?

24   Tyler Wall wants to tile her kitchen by repeating this 4 × 4 pattern of tiles, starting from the bottom left corner and working across and up. The area that she wants to tile measures 18 tiles across and 14 tiles up. Tiles are sold in packs of 10. How many **packs** of white tiles will she need to buy?

14 tiles

18 tiles
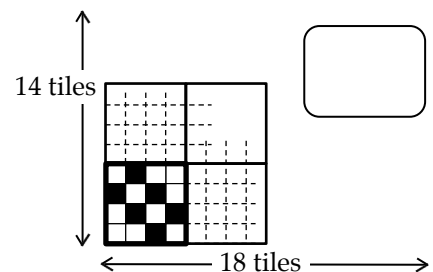
25   Kim writes all the counting numbers from 1 to 100 in order without leaving any gaps:

123456789101112131415 …

What is the 100th digit that Kim writes?

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