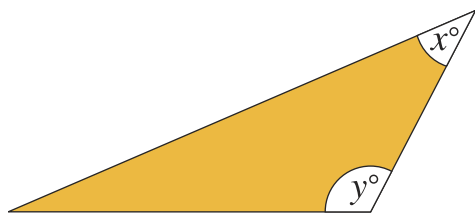


1. This is a diagram of a triangle.



NOT TO SCALE

Which of these **cannot** be values for x and y ?

	x	y
(A)	70	120
(B)	50	120
(C)	70	100
(D)	50	100

3. A very large number is represented, as shown.

$$333^{444}$$

What is the last (units) digit of this number?

- (A) 1
- (B) 3
- (C) 7
- (D) 9

4. Katya has a set of Russian dolls. The heights of her dolls are shown. They increase by a fixed ratio.



The smallest doll fits in the next, larger doll. They both fit inside the next doll. The largest doll shown fits all four of the other dolls inside it.

Katya calculates the height of the doll that could fit exactly 700 dolls inside it, including the dolls shown.

She writes the answer as:

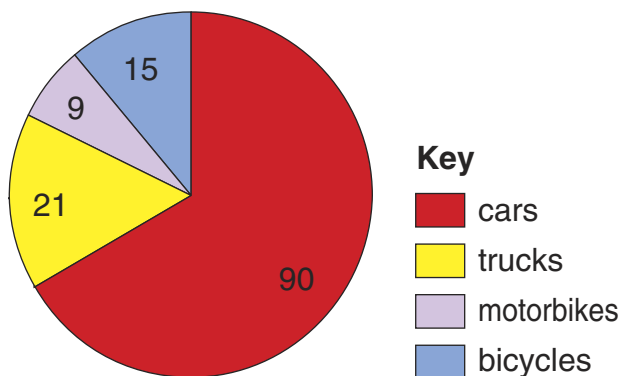
$$1.1603 \times 10^x \text{ mm}$$

What is the value of x ?

(Write only the number on your Answer Sheet.)

2. This is a sector graph (pie graph).

Vehicles Passing the School



What is the angle at the centre for the number of cars passing this school?

- (A) 296°
- (B) 284°
- (C) 257°
- (D) 240°

END OF PAPER

Question solutions—Class 10

Question 1

Answer key: A

Category: Space and geometry

Options

Reasoning for options

- A Correct. The sum of x and y adds to 190° (more than the angle sum)
 B Incorrect. The sum of x and y is less than 180° .
 C Incorrect. The sum of x and y is less than 180° .
 D Incorrect. The sum of x and y is less than 180° .

Difficulty level: Easy. About 80-100% expected corrected.

Question 2

Answer key: D

Category: Chance and data

Options

Reasoning for options

- A Incorrect guess.
 B Incorrect guess.
 C Incorrect guess.
 D Correct.

The total number of vehicles = 135

$$\begin{aligned} \text{The angle at the centre for cars} &= \frac{360}{135} \times 90 \\ &= 240 \end{aligned}$$

Difficulty level: Medium. About 31-79% expected correct.

Question 3

Answer key : A

Category: Number

Options

Reasoning for options

A

This question has too many digits to do on a calculator, so another strategy must be found. The last digit (in fact the last two digits) in a multiplication depends on the last two digits being multiplied.

Thus we can do the question with 33×33 and look for a pattern in the answers.

33^1	is 33	ends in 3
33^2	is 1089	ends in 9
33^3	multiply 89 by 33	ends in 7
33^4	multiply last two digits 37 by 33	ends in 1
33^5	multiply last two digits 21 by 33	ends in 3
33^6	multiply last two digits 93 by 33	ends in 9
33^7	multiply last two digits 69 by 33	ends in 7
33^8	multiply last two digits 77 by 33	ends in 1

The pattern repeats every 4th power of 33. Every multiple power of 4 will end in 1.

Power 444 is a multiple of 4 so it ends in 1.

- B 3 is one of the other recurring end digits
 C 7 is one of the other recurring end digits
 D 9 is one of the other recurring end digits

Difficulty level: Hard. Less than 31% expected correct.

Question solutions—Class 10

Question 4

Answer key: 89
Category: Number

Reasoning

Height of smallest doll is 40.5mm.

Rate of increase in height of successive dolls is $\frac{128}{96}$.

Height of doll with 700 dolls inside

$$= 40.5 \times \left(\frac{128}{96}\right)^{700}$$

$$= 1.1603 \times 10^{89} \text{ mm}$$

Therefore the value of x is 89.

Difficulty level: Hard. Less than 31% expected correct.
