WESTMINSTER SCHOOL

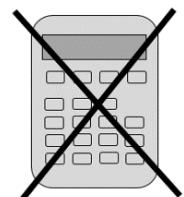# Sixth Form Entrance Examination

Sample Paper 2

MATHEMATICS

Question paper

Time: 45 minutes

Instructions to candidates:

- This is a multiple-choice test. **Your Answer Sheet will be marked only by a machine**.
- Write in **B or HB pencil** only.

- Check that your name and candidate number are printed correctly on the Answer Sheet.
- Write your name and candidate number in the boxes on the Answer Sheet.

- For each question, indicate the **one** correct answer by <u>shading</u> **a circle on the Answer Sheet**.
- Refer to the instructions on the Answer Sheet.

- **Each correct answer scores 4 points.**
- **Each incorrect answer loses 1 point**. **Unanswered questions will score 0 points.**
- There are 25 questions in total.

- Rough working can be done in this booklet or on additional plain paper.
- **Only your Answer Sheet will be marked.**

- **You may NOT use a calculator.**

**Indicate all your answers on the multiple choice answer sheet provided.
This question paper will NOT be marked.**

01. What do you get if you subtract $4 + 2x$ from 4?

    A $2x$

    B $4 - 2x$

    C $-2x$

    D $2x - 4$

    E   The correct answer is not given.

02. What is one third of $6 + 3x$?

    A $2 + 3x$

    B $3 + 2x$

    C $6 + x$

    D $18 + x$

    E   The correct answer is not given.

03. What is the value of $5(p + qr)$ when $p = 4$, $q = 3$, and $r = -5$?

    A -55

    B -10

    C 10

    D 60

    E   The correct answer is not given.

04. Multiply out and simplify $(2x + 3)(x - 5)$.

    A $2x^2 - 2x - 15$

    B $2x^2 + 2x - 15$

    C $2x^2 - 2x + 15$

    D $2x^2 + 2x + 15$

    E   The correct answer is not given.

05. Which of the following is a correct simplification of $3(x-2) - 5(2-x)$?

A $2x + 16$

B $16 - 2x$

C $16 - 8x$

D $8x - 16$

E The correct answer is not given.

06. Fully factorise the expression $x^2 - 5x - 6$.

A $(x-3)(x-2)$

B $(x+1)(x-6)$

C $x(x-5) - 6$

D The expression cannot be factorised using whole numbers.

E The correct answer is not given.

07. Which of the following is a correct simplification of $(x-2)^2 - (x+2)(x-2)$?

A 8

B $-4x$

C $4x$

D $x^2 - 8$

E The correct answer is not given.

08. Given that $2x + 3y = 6$ and $y = 4 - 3x$, find the value of $\dfrac{x}{y}$.

A $\dfrac{2}{3}$

B $\dfrac{3}{5}$

C $\dfrac{5}{4}$

D 2

E The correct answer is not given.

09. What is the result of dividing $\dfrac{3}{x}$ by $\dfrac{3}{x^2}$?

    A $\dfrac{1}{3}$

    B $\dfrac{1}{x}$

    C x

    D $\dfrac{x^2}{3}$

    E   The correct answer is not given.

10. Which if the following expressions is identical to $\dfrac{2x+3}{x}$

    A 5

    B $x+3$

    C $\dfrac{x+3}{x}$

    D $2+\dfrac{3}{x}$

    E   The correct answer is not given.

11. Which of the following is a correct simplification of $\dfrac{x^2+4x+4}{x^2-4}$?

    A $x+1$

    B $\dfrac{x-2}{x-4}$

    C $\dfrac{x+2}{x-2}$

    D   The fraction is already in its simplest form.

    E   The correct answer is not given.

12. Write $\dfrac{3x+1}{6} - \dfrac{2x-3}{4}$ as a single fraction

   A $\dfrac{1}{2}$

   B $-\dfrac{7}{12}$

   C $\dfrac{x-2}{2}$

   D $\dfrac{x-2}{12}$

   E   The correct answer is not given.

13. Which of the following is a correct rearrangement of $\dfrac{1}{f} = \dfrac{1}{u} + \dfrac{1}{v}$

   A $f = u + v$

   B $\dfrac{v}{f} = \dfrac{v}{u}$

   C $f = \dfrac{uv}{u+v}$

   D $uv = \dfrac{f}{u+v}$

   E   The correct answer is not given.

14. Given that $3 < -3x \leq 6$ which of the following is true?

   A $-2 \leq x < -1$

   B $-2 < x \leq -1$

   C $-1 \leq x < 2$

   D $-1 < x \leq 2$

   E   The correct answer is not given.

15. Which of the statements A to D is false? If none are false then selection option E.

  A $6(ab) \equiv (6a)b$

  B $6(ab) \equiv (6b)a$

  C $6(ab) \equiv 6ab$

  D $6(ab) \equiv (6a)(6b)$

  E   None of the above statements are false.

16. Which of the statements A to D about the line $2x + 3y - 5 = 0$ is false? If none are false then selection option E.

  A   The point $(1, 1)$ lies on the line

  B   The line crosses the x-axis at the point $(\frac{5}{2}, 0)$

  C   The curve crosses the y-axis at the point $(0, \frac{5}{3})$

  D   The gradient of the line is -2

  E   None of the above statements are false.

17. A bucket and spade costs £1.50. If the bucket costs 1 pound more than the spade, then how much does the spade cost?

  A   15 pence

  B   25 pence

  C   50 pence

  D   75 pence

  E   The correct answer is not given.

18. The length of a rectangle is 12 cm, and the area of the rectangle is 48 cm. The length of the perimeter of a square is the same as the length of the perimeter of the rectangle. What is the area of the square?

  A $16 \, \text{cm}^2$

  B $64 \, \text{cm}^2$

  C $256 \, \text{cm}^2$

  D   There is not enough information to know for sure.
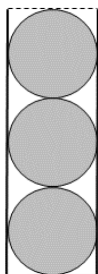
  E   The correct answer is not given.

19. On a map, 1 cm represents a real-life distance of 10 km. A region of a town has a real-life area of 810 km^2. What is the area of this region on the map?

A 8.1 cm^2

B 9 cm^2

C 81 cm^2

D 90 cm^2

E The correct answer is not given.

20. Some people are on a bus. At the first stop half of the people get off, and five people get on. There are now one third fewer people on the bus than there were before. How many people are now on the bus?

A 10

B 12

C 24

D The situation described is not possible

E The correct answer is not given.

21. Three identical spheres just fit inside a cylindrical tube as shown below.

The cylinder, with the spheres inside, is filled up to the top with water. If the spheres are carefully removed, how far up the cylinder will the water go?
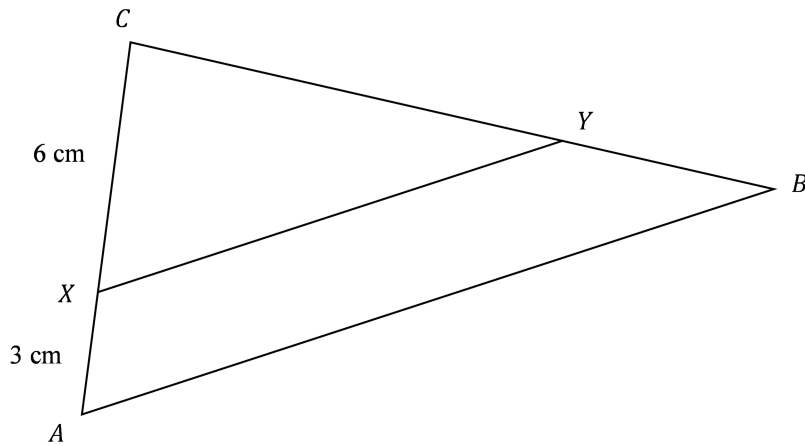
A A sixth of the way up

B A quarter of the way up

C A third of the way up

D There is not enough information to decide for sure

E The correct answer is not given.

22. Last year, two sisters were given Christmas money by their aunt. The money was split between the younger sister and older sister in the ratio 3 : 5. This year, their aunt is going to give the sisters the same total amount of money, but wants the younger sister to get one-third more than she got last year. In what ratio will the money be split between the younger and older sister this year?

   A   4 : 5

   B   9 : 10

   C   1 : 1

   D   There is not enough information to decide for sure

   E   The correct answer is not given.

23. Jeremie, Kyumin, and Sharon are running laps of St. James's Park for charity. For each lap they run, they will make £20 from their sponsors. It takes Jeremie 12 minutes to run a lap, it takes Kyumin 18 minutes to run a lap, and it takes Sharon 15 minutes to run a lap. They all start together, and they stop running when they all cross the finish line together for the first time. How much money do they make in total?

   A   £960

   B   £3600

   C   £4320

   D   £10800

   E   The correct answer is not given.

24. Adrianna cycles at a speed of 13.5 metres per second. Jit cycles at a speed of 10.5 metres per second. Adrianna and Jit are initially 1000 metres away from each other. At the same time, they both start cycling directly towards each other. When they meet, how much further has Adrianna cycled than Jit?

   A   100 metres

   B   125 metres

   C   135 metres

   D   150 metres

   E   The correct answer is not given.

25. In the diagram below, which is not to scale, shows a triangle ABC split into a smaller triangle XYC and a trapezium $ABYX$, by a line XY.

Line XY is parallel to line AB.

The length of AX is 3 cm and the length of XC is 6 cm.

The larger triangle ABC has area $27\,\text{cm}^2$.

What is the area of trapezium $ABYX$?

A $9\,\text{cm}^2$

B $15\,\text{cm}^2$

C $18\,\text{cm}^2$

D   There isn't enough information to decide for sure

E   The correct answer is not given.

END OF QUESTIONS