MR TOMPKINS EDTECH

Maths and Edtech videos for students and teachers...

GCSE Exam Questions Compilation

Top 10 Topics for Paper 1 (Foundation)

Complete the questions first, and then use the video to mark/uplevel your work in red pen. Video link: https://youtu.be/mL0iqoX5ZAY

Suitable for Foundation Tier Students

- Algebraic expressions
- Substitution
- Solving equations
- Sequences
- Percentages
- Indices
- Inequalities
- Standard form
- Calculate exactly with π

Algebraic Expressions

Q1. (a) Circle the expression that is equivalent to $4 \times x$

x^4 $4x$ 4^x $x \times x \times x \times x$

(1)

(b) Circle the expression that is equivalent to $y \times y \times y$

$3y$ y^2 $3y^2$ y^3

(1)

(c) Circle the expression that is equivalent to $a + b$

$b + a$ ab ba $2ab$

(1)
(Total 3 marks)

Q2. Simplify $7x + 5 - 8 - 3x$
Circle your answer.

x $4x + 3$ $4x - 3$ $10x - 3$

(Total 1 mark)

Q3. (a) Simplify $y \times y$

Answer _____

(1)

(b) Simplify $5a + 2 - a + 9$

_____

_____

Answer _____

(2)
(Total 3 marks)

Q4. Simplify $7a + 5b + 3a - 2b$

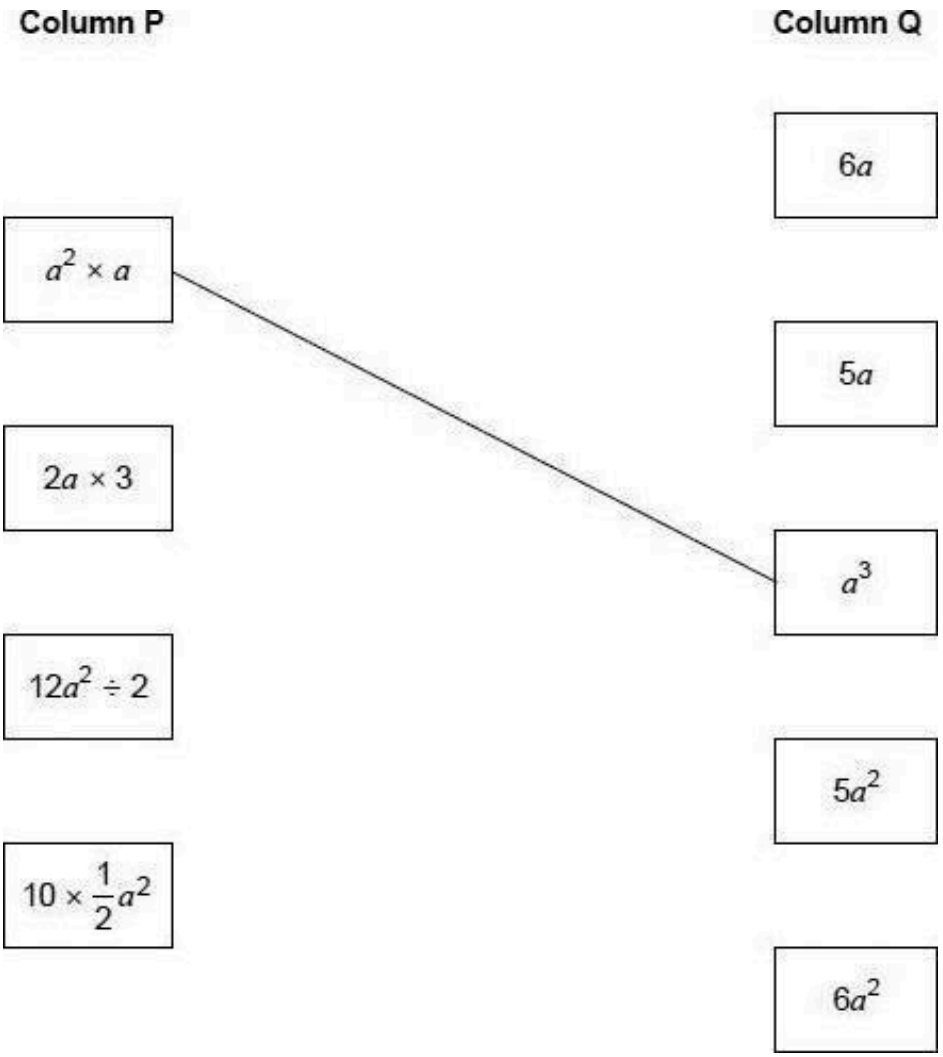
_____

Answer _____

(Total 2 marks)

Q5. Match each expression in Column P with the equivalent expression in Column Q.

One has been done for you.



(Total 3 marks)

Q6. (a) Simplify fully $7a + 3a - 4a$

_____

Answer _____

(1)

(b) Simplify fully $3 \times m \times 2 \times p$

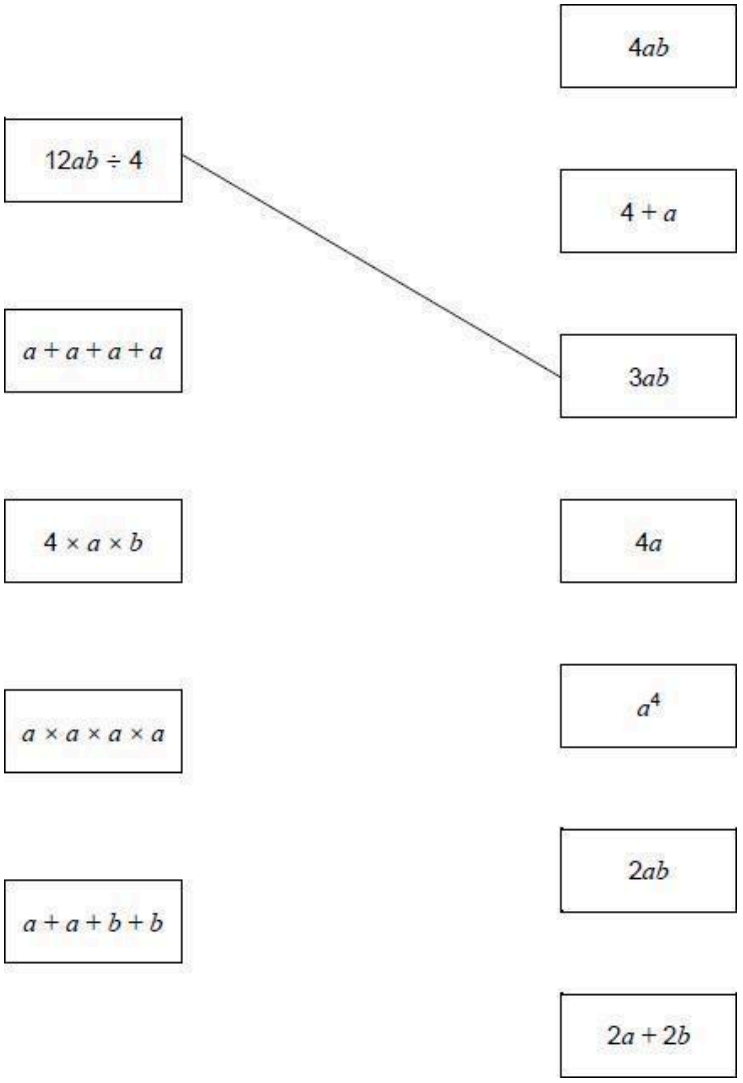
_____

Answer _____

(1)

(Total 2 marks)

Q7. Match each expression on the left with one on the right. One has been done for you.



(Total 4 marks)

Q8. Simplify $12x^2 - 8x^2 - 5x + 2x$

Answer _____

(Total 2 marks)

Q9. Simplify fully $(2\times4a) + 9 + \frac{15a}{3} - 7$

Answer _____

(Total 3 marks)

Substitution

Q10. $P = 2a + 3b$

Work out the value of P when $a = 11$ and $b = 5$

Answer _____

(Total 2 marks)

Q11. Work out the value of $a^2 - 4a$ when $a = 10$

Answer _____

(Total 2 marks)

Q12. Work out the value of $4(2x + 3y)$ when $x = 8$ and $y = -3$

Answer _____

(Total 2 marks)

Q13. $P = 2L + 3W - 6Y$

Work out the value of P when $L = 5$, $W = 4$ and $Y = \frac{1}{2}$

Answer _____ **(Total 3 marks)**

Q14. Here are three expressions.

$\frac{b}{a}$ $\qquad a - b \qquad$ ab

When $a = 2$ and $b = -6$ which expression has the smallest value?

You **must** show your working.

_____

_____

_____

_____

Answer _____

(Total 2 marks)

Solve Equations

Q15. Solve $7x = 56$

_____

$x =$ _____

(Total 1 mark)

Q16. (a) Solve $n + 7 = 103$

_____

$n =$ _____

(1)

(b) Solve $\frac{m}{6} = 12$

_____

_____

$m =$ _____

(1)

(Total 2 marks)

Q17. Solve $25 - y = 18$

$y =$ _____

(Total 1 mark)

Q18. (a) Solve $x + 12 = 29$

$x =$ _____

(1)

(b) Solve $0.5y = 20$

$y =$ _____

(1)

(Total 2 marks)

Q19. Solve $6x - 11 = 13$

$x =$ _____

(Total 2 marks)

Q20. Solve $10x - 3 = 21$

$x =$ _____

(Total 2 marks)

Q21. Solve $\frac{x}{3} - 9 = 12$

$x =$ _____

(Total 2 marks)

Q22. Solve $4(x + 5) = 15$

$x =$ _____

(Total 3 marks)

Q23. (a) Solve $5(x - 2) = 35$

$x =$ _____

(3)

(b) Solve $9y + 1 = 6y + 13$

$y =$ _____

(3)

(Total 6 marks)

Sequences

Q24. The nth term of a sequence is $5n - 2$. Work out the 3rd term. Circle your answer.

51 5 123 13

(Total 1 mark)

Q25. (a) The term-to-term rule for a sequence is

add 4 then divide by 2

The 1st term of the sequence is 36. Work out the 3rd term.

_____

_____

Answer _____ **(2)**

(b) The term-to-term rule for a different sequence is

divide by 3 then add 10

The 2nd term of this sequence is 60. Work out the 1st term.

_____

_____

Answer _____ **(2)**

(Total 4 marks)

Q26. (a) The term-to-term rule of a sequence is

Add 8 and divide by 2

The first term of the sequence is –24. Work out the next two terms.

_____

_____

_____

_____

Answer _____ and _____

(2)

(b) The term-to-term rule of a different sequence is

Subtract 1 and multiply by 5

The third term of this sequence is 120

.... 120

Work out the first term.

_____

_____

_____

_____

_____

Answer _____

(2)

(Total 4 marks)

Q27. (a) Here is a sequence.

5 8 11 14 17 .....

Write down the next number in the sequence.

Write down the rule for continuing the sequence.

_____

Next number _____

Rule _____

(2)

(b) Here is a different sequence.

Work out the nth term of the sequence.

7 13 19 25 31

_____

_____

Answer _____

(2)

(Total 4 marks)

Q28. Here are the first five terms of a linear sequence.

9 15 21 27 33 ...

Work out the nth term.

_____

_____

Answer _____

(Total 2 marks)

Q29. Here is a linear sequence.

46 40 34 28 22 ___

Work out the nth term of the sequence.

_____

_____

Answer _____

(Total 2 marks)

Q30. All the terms of a **geometric** progression are positive.

The second and fourth terms are shown.

……. 4 …… 16

Work out the first and third terms.

_____

_____

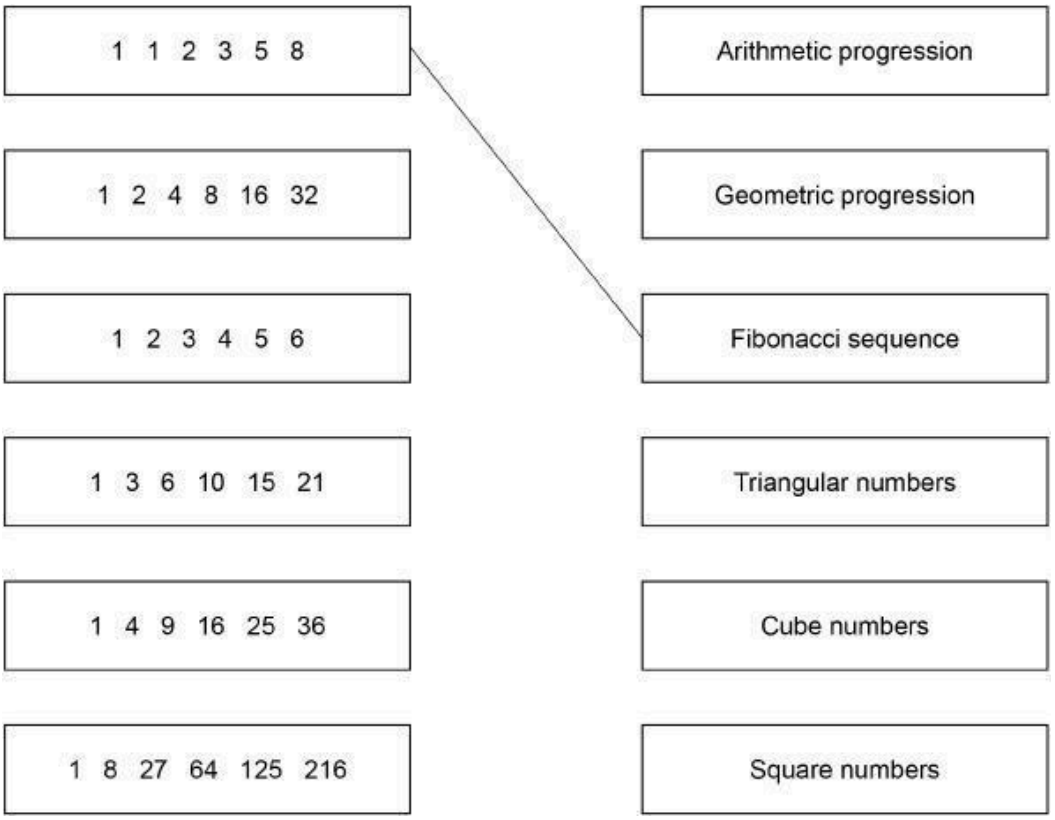
_____

First term _____

Third term _____

(Total 2 marks)

Q31. Match each sequence to its description. One has been done for you.



(Total 4 marks)

Q32. The nth term of a sequence is $12n - 5$

Work out the numbers in the sequence that

have two digits

and

are **not** prime.

Answer _____

(Total 3 marks)

Percentages

Q33. Work out 20% of 14 000

_____

_____

_____

Answer _____

(Total 2 marks)

Q34. Work out 80% of 300

_____

_____

_____

Answer _____

(Total 2 marks)

Q35. Work out 51% of 400

_____

_____

_____

Answer _____

(Total 2 marks)

Q36. (a) What is 70 out of 200 as a percentage?

Answer _____ %

(1)

(b) Work out 0.5% of 920

_____

_____

_____

Answer _____ **(2)**

(Total 3 marks)

Q37. 5% of a number is 31

1% of the same number is 6.2

Work out 13% of the number.

Answer _____

(Total 3 marks)

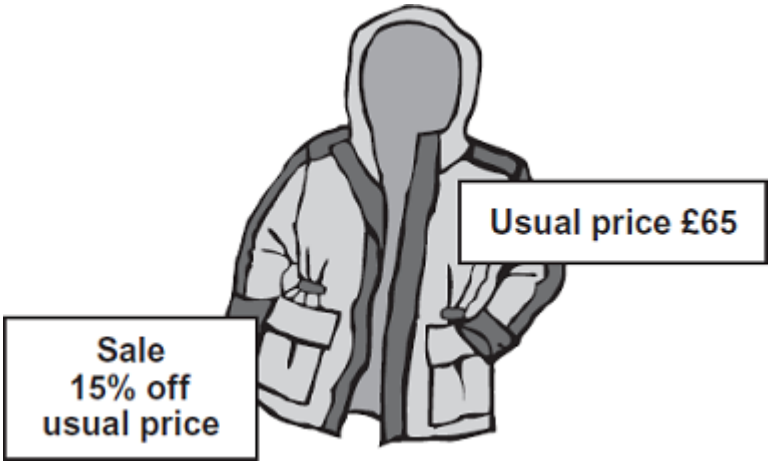
Q38. 10% of 2100 is 210

Work out 43% of 2100

Answer _____

(Total 3 marks)

Q39.



Work out the sale price.

Answer £ _____

(Total 3 marks)

Q40.

Increase 6800 by 12%.

Answer _____

(Total 3 marks)

Indices

Q41. Simplify $2^5 \times 2^3$

Circle your answer.

4^8 2^8 2^{15} 4^{15}

(Total 1 mark)

Q42. Simplify $\left(5^4\right)^2$

Circle your answer.

5^6 5^8 25^6 25^8

(Total 1 mark)

Q43. (a) Simplify $a^{20} \times a^5$

Answer _____

(1)

(b) Simplify $\frac{a^{20}}{a^5}$

Answer _____

(1)

(c) Simplify $(a^{20})^5$

Answer _____

(1)

(Total 3 marks)

Q44. Work out $\frac{3^{12}}{3^7}$

Give your answer as a whole number.

_____

_____

_____

Answer _____

(Total 2 marks)

Q45. Work out the value of $(3^{12} \div 3^5) \div (3^2 \times 3)$

Answer _____

(Total 3 marks)

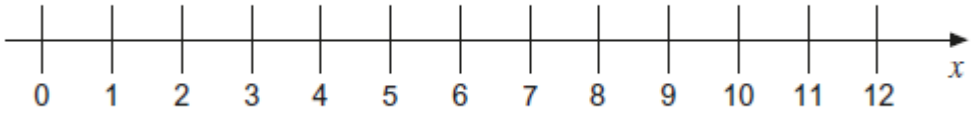
Inequalities

Q46. (a) Write down **all** the integers that satisfy $-3 \leq n < 2$

_____

Answer _____ **(1)**

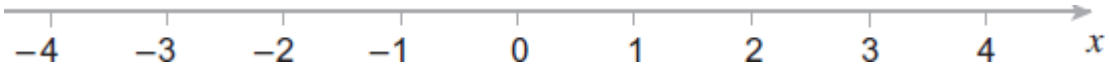
(b) Show $2 < x \leq 10$ on the number line.



(2)

(Total 3 marks)

Q47. (a) Show the inequality $x > -2$ on the number line.



(1)

(b) Solve the inequality $3x + 5 \leq 11$

_____

_____

Answer _____ **(2)**

(Total 3 marks)

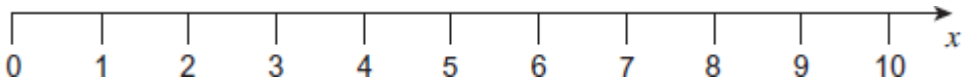
Q48. (a) Solve $4x - 7 \leq 13$

_____

_____

Answer _____ **(2)**

(b) Show $3 < x \leq 8$ on the number line.



(2)

(Total 4 marks)

Q49. Solve $5(x + 3) < 60$

Answer _____

(Total 2 marks)

Q50. Solve $5x + 6 > 3x + 15$

Answer _____

(Total 3 marks)

Standard Form

Q51. Circle the number that is written in standard form.

0.9×10^{-3} $6 \times 10^{0.5}$ 5.2×10^{-4} 12×10^{7}

(Total 1 mark)

Q52. (a) Write in standard form 12 500

Answer _____

(1)

(b) Write as an ordinary number 3.4×10^{-2}

Answer _____

(1)

(Total 2 marks)

Q53. Write 9.2×10^{-3} as an ordinary number.

_____

Answer _____

(Total 1 mark)

Q54. (a) Write the number 0.000 000 7 in standard form.

_____

Answer _____

(1)

(b) Write 3×10^5 as an ordinary number.

_____

Answer _____

(1)

(c) Work out $4 \times 10^3 \times 8 \times 10^5$

Give your answer in standard form.

_____

_____

Answer _____ **(2)**

(Total 4 marks)

Q55. Work out 2000 × 70 000

Give your answer in standard form.

_____

_____

_____

_____

_____

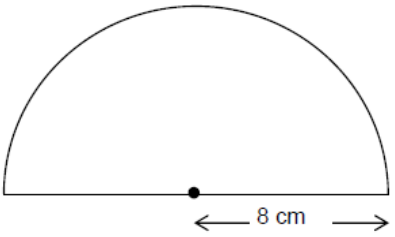
_____

Answer _____

(Total 2 marks)

Calculating in Terms of π

Q56. The diagram shows a semicircle of radius 8 cm

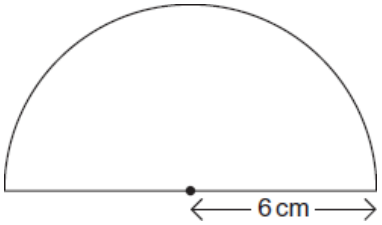


Work out the area of the semicircle. Give your answer in terms of π.

Answer _____ cm²

(Total 2 marks)

Q57. Work out the area of a semi-circle of radius 6 cm. Give your answer in terms of π.

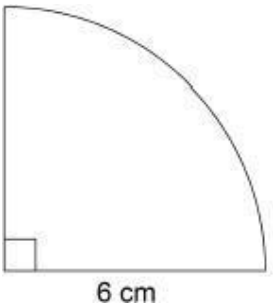


Answer _____ cm²

(Total 2 marks)

Q58. Here is a quarter circle of radius 6 cm

Not drawn accurately



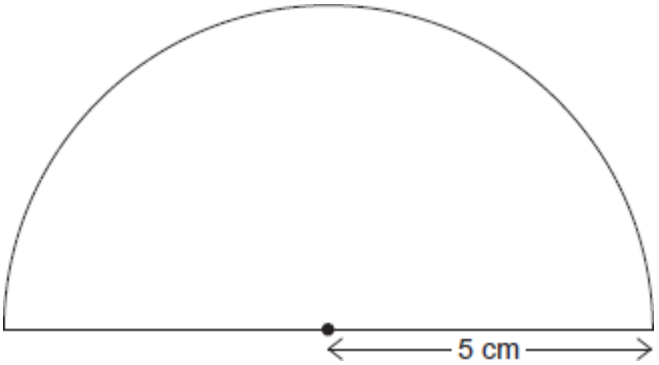
Work out the area of the quarter circle.

Give your answer in terms of π.

Answer _____ cm²

(Total 2 marks)

Q59. This semi-circle has a radius of 5 cm

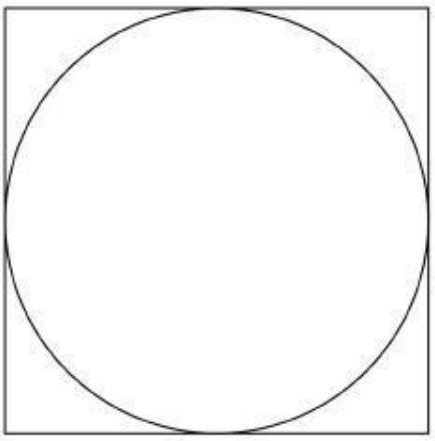


Work out the **perimeter** of the semi-circle.
Give your answer in terms of π.

Answer _____ cm

(Total 3 marks)

Q60. Here is a circle touching a square.



Not drawn accurately

The area of the square is 64 cm^2

Work out the area of the circle. Give your answer in terms of π.

Answer _____ cm^2

(Total 3 marks)