## GCSE Revision - A Bit of Everything

## OCR Foundation

This is a collection of questions from all the topics on the revision checklist

## Guidance

1. Check your answers seem right.
2. Always show your workings
3. Take your time when working through this collection of questions


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1. Here are four different digits.

$$
\begin{array}{llll}
8 & 1 & 5 & 6
\end{array}
$$

(i) Put one digit in each box to make the smallest total.

You may only use each digit once.

(ii) Write down the total
$\qquad$
2. The heights of 7 children are shown below.

132 cm
1.2 m

98 cm
$0.99 m$
116 cm
1.4 m
$1.33 m$
(a) Change 132 cm into metres.
$\qquad$
(b) Change 98 cm into metres.
(c) Order the heights, starting with the shortest.
(d) Work out the median.

Children over 1 metre may go on a ride at a funfair.
(e) What fraction of the children may not go on the ride.
3. The temperature, in ${ }^{\circ} \mathrm{C}$, at midnight at a weather station on 5 days was recorded

| Day | Monday | Tuesday | Wednesday | Thursday | Friday |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Temperature | -4 | 1 | -6 | 1 | -2 |

(a) What fraction of the days had a temperature below $0^{\circ} \mathrm{C}$ ?
$\qquad$
(b) What is the range of the temperatures?
. ${ }^{\circ} \mathrm{C}$
4. From the list of numbers

$$
\begin{array}{lllllll}
3 & 5 & 7 & 9 & 11 & 15 & 24
\end{array}
$$

(a) Write down a factor of 12
$\qquad$
(b) Write down a factor of 28
(c) Write down a factor of 81
5.

(a) Work out the output, when the input is 10.
$\qquad$
(b) Work out the input, when the output is 25 .
$\qquad$
(c) If the input is the same as the output, work out the input.
$\qquad$
6. Don says
"the difference between two consecutive cube numbers is even."

Is Don correct?
You must show your workings.

## 7. Trains leave Bristol

to Cardiff every 15 minutes
to London every 21 minutes
A train to Cardiff and a train to London both leave Bristol at 11am.

At what time will a train to Cardiff and a train to London next leave Bristol at the same time?
8. Penny gets £8 pocket money.

She is given an increase of $£ 3$.
(a) Write down $£ 3$ as a fraction of $£ 8$
$\qquad$
(b) Write your answer as a percentage
9. Jo has a recipe for Bolognese Sauce,

## Bolognese Sauce

| Minced Beef | 500 g |
| :--- | :--- |
| Chopped Tomatoes | 750 g |
| Mushrooms | 40 g |
| Chicken Stock | 150 ml |

She only has 400 g of minced beef.
How much of the other ingredients should she use?
$\qquad$
Chopped Tomatoes:

Mushrooms:
.$g$

Chicken Stock:
. 9
(3)
10. The points $A(-3,2), B(-1,4)$ and $D(-1,-3)$.

$A B C D$ is a kite.
Complete the kite and write down the coordinates of $C$.
$\qquad$
11. An airplane has economy and first class seating.

There are $s$ seats in each row in economy.
There are $t$ seats in each row in first class.

There are 9 rows in first class and 24 rows in economy.

Write down an expression, in terms of $s$ and $t$, for the number of seats on the airplane.
12.


DEF is a straight line.
$C E=C F$.
Angle ECF is $40^{\circ}$.
Angle DCE is $15^{\circ}$.
Find the size of the angle marked $y$.
13. Shown below is a kite.

(a) Find $x$
$\qquad$
. ${ }^{0}$
(b) Find y
14. Miss Jackson asked the 32 students in her tutor group which language they study.

Each student studies one language only.


Half of the students in the tutor group study Spanish.
Six more students study German than French.
Complete the bar chart.
15. The diagram below shows a regular hexagon.

(a) Write down the order of rotational symmetry of the hexagon.
$\qquad$
(b) On the diagram draw in all the lines of symmetry.
16. Complete the table below.

|  | Faces | Edges | Vertices |
| :---: | :---: | :---: | :---: |
| Cube |  |  | 8 |
| Square-based Pyramid | 5 |  |  |
| Triangular Prism |  | 9 |  |

17. Here is part of a train timetable.

|  | Departure times |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| Antrim | $12: 30$ | $13: 00$ | $14: 00$ | $16: 00$ |
| Randalstown | $12: 45$ | $13: 15$ | $14: 15$ | $16: 15$ |
| Ballymena | $13: 01$ | $13: 31$ | $14: 31$ | $16: 31$ |
| Ballycastle | $13: 39$ | $14: 09$ | $15: 09$ | $17: 09$ |

Freddy wants to travel from Randalstown to Ballycastle.
He arrives at Randalstown at 13:03 to catch the next train to Ballycastle.
(a) How long does this train journey take?

Jennifer lives in Antrim and her friend lives in Ballymena. Jennifer lives a 5 minute walk from Antrim train station. Her friend lives a 30 minute walk from Ballymena train station. Jennifer wants to arrive at her friend's house before 3pm. Plan Jennifer's journey to her friend's house.
18. Here is a route map between four towns.

The distances, in kilometres, between some of the towns are shown on the map.


The distance from Swantown to Oldville is 95 kilometres.
(a) Work out the distance from Newham to Oldville.
$\qquad$ kilometres
(b) Complete the distance chart below to show the distances between the towns.

(3)
19. The table shows the average price of unleaded petrol in England over 5 years.

| Year | Price in pence |
| :---: | :---: |
| 2011 | 111 |
| 2012 | 128 |
| 2013 | 133 |
| 2014 | 132 |
| 2015 | 108 |

(a) Draw a line graph for the data

(2)
(b) Between which two consecutive years did the price increase the most?
and
(1)
20.


Write down the translation vector that would take $A$ to $B$.

$$
\begin{equation*}
\binom{\ldots \ldots \ldots}{\ldots \ldots \ldots} \tag{1}
\end{equation*}
$$

21. Here is a list of words connected to circles.

Tangent
Radius
Diameter Chord
Centre
Circumference

Label the four boxes in the diagram below, by choosing the correct word from the list.

22. Here are 4 diagrams.


Three of these diagrams show a net for a square-based pyramid.
Write down the letter of the diagram which is not a net for a square-based pyramid.
23. Simplify
(a) $8 \times y \times 2$
(b) $a \times a \times a$
$\qquad$
(c) $3 \times a \times c$
$\qquad$
(d) $\mathrm{w} \times 5 \times \mathrm{e}$
$\qquad$
(e) $2 \mathrm{y} \times \mathrm{y}$
$\qquad$
(f) $3 \mathrm{a} \times 4 \mathrm{c}$
24. 100 people study one language at a college.

Some people study French.
Some people study Spanish.
The rest of the people study German.
54 of the people in Year 10 and the rest are in Year 11. 20 of the 29 people who study Spanish in Year 11.
31 people study German.
15 Year 11 students study French.
Work out the number of Year 10's who study German.
25. The table gives information about the income of 200 households in a village.

| Income (thousands) | Frequency |
| :---: | :---: |
| $0<I \leq 20$ | 40 |
| $20<I \leq 40$ | 75 |
| $40<I \leq 60$ | 64 |
| $60<I \leq 80$ | 20 |
| $80<I \leq 100$ | 1 |

Draw a frequency polygon for the information in the table.

26. Magnus flips a fair coin once and rolls an ordinary dice once.
(a) Write down all the possible outcomes.
$\qquad$
$\qquad$
$\qquad$
(b) Find the probability that Magnus gets a head and a 3.
27.
(a) Simplify $8 a+3 c-5 c+3 a$
(b) Simplify $3 a+2 w-5 a-9 w$
$\qquad$
(c) Simplify $3 y^{2}+2 w^{2}+y^{2}-w^{2}$
28. Hannah is recording the number of letters in each word in an article.

These are the first ten lengths.

| 3 | 4 | 5 | 6 | 2 | 4 | 3 | 7 | 3 | 6 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

(a) Work out the median.
(b) Calculate the mean.

The $11^{\text {th }}$ word has 4 letters.
(c) Tick the box which describes what affect this will have on the mean.

| The mean will <br> decrease | The mean will <br> remain the same | The mean will <br> increase |
| :--- | :--- | :--- |

(d) Tick the box which describes what affect this will have on the median.

| The median will <br> decrease | The median will <br> remain the same | The median will <br> increase |
| :--- | :--- | :--- |

29. James bought a motor scooter on hire purchase.

He paid a deposit of $£ 275$ and 18 monthly payments of $£ 36$.
At the end of the payments, he sold the motor scooter for £450.
How much did it cost him in total?
30. Paul has $£ 10$ to buy rulers at 60 p each.

What change should he get if he buys as many as possible?
31. James has $x$ pence.

Hannah has 5 pence more than James.
Liam has 2 pence less than James.

The total amount of money they have is 75 pence.
(a) Use this information to write down an equation in $x$.
$\qquad$
(b) Solve the equation to find out how much money James has.
32. Here is a trapezium.

(a) Mark a right angle with a letter R.
(b) Mark an acute angle with a letter A.
(c) Mark an obtuse angle with a letter O .
33. (a) Write 5725 to the nearest 100.
(b) Write 83.07718 correct to two decimal places.
(c) Write 6.35 correct to 1 decimal place.
$\qquad$
(d) Write 129.34952 correct to 1 decimal place.
34. Work out an estimate for

## $596.4 \times 2.06$ 0.521

35. Work out
(a) $(2+5)^{2}$
(b) $5+3 \times 6$
(c) $22-14 \div 2$
36. Timothy orders the following items at a restaurant.

4 pizzas at $£ 4.49$ each.
2 garlic breads at $£ 3.10$ each.
2 orange juices at $£ 1.19$ each.
2 sparkling water at 99p each.

Complete the bill below.

| Corbett Cuisine |  |  |
| :--- | :---: | :---: |
|  | $£$ | pence |
| 4 pizzas at £4.49 | 17 | 96 |
| 2 garlic bread at $£ 3.10$ |  |  |
| 2 orange juice at $£ 1.19$ |  |  |
| 2 sparkling water at 99p |  |  |
| Total |  |  |

37. From the list of numbers

$$
\begin{array}{llllllll}
7 & 9 & 12 & 21 & 23 & 30 & 36 & 45
\end{array}
$$

(a) write down the multiples of 7 .
$\qquad$
(b) write down the multiples of 5 .
38. Sort all the numbers into the correct boxes.

(3)
39. Arrange these in order, starting with the smallest.
$3^{2}$
$\sqrt{ } 100$
$4^{2}$
$\sqrt{ } 80$
$\qquad$
40. (a) Write 60 as a product of its prime factors.
(b) Find the Lowest Common Multiple (LCM) of 60 and 75.
41. Bill is 80 years old.

His son Max is $5 / 8$ of his age.

His granddaughter Jayne is $1 / 5$ of his age.

How many years older than Jayne is Max?
42. Work out, as a simplified fraction.

$$
\frac{3}{4}+\frac{2}{9}
$$

43. Work out

$$
1 \frac{1}{3} \times 2 \frac{2}{5}
$$

Give your answer as a mixed number.
44. Work out

$$
\frac{2}{17} \div \frac{2}{5}
$$

Give your answer as a fraction in its simplest form.
45. At Frome International train station, $35 \%$ of trains were late in a week. In that week there were 440 trains.

Calculate how many trains were on time.
46. At a rugby match, the ratio of children to adults is $2: 3$

There are 80 children in the crowd.
Each adult ticket costs $£ 8$
Each child ticket costs a quarter of the adult ticket.
Work out the total money made from ticket sales.
47.

$$
v=u+a t
$$

(a) Work out v when $\mathrm{u}=23, \mathrm{a}=4$ and $\mathrm{t}=3$
(b) Work out $u$ when $v=30, \mathrm{a}=2$ and $\mathrm{t}=8$
(c) Work out t when $\mathrm{v}=40, \mathrm{u}=12$ and $\mathrm{a}=4$
48. Tony makes a fair six-sided spinner.

The spinner has the numbers 7,8 and 9 on it.

The probability the spinner will land on 7 is greater than the probability that the spinner will land on 8.

The probability that the spinner will land on 9 is $1 / 3$

Write the numbers on the spinner.

49. The table shows the charge ( $£$ ) by plumbers for jobs of different duration (hours).

| Job duration (hours) | 1 | 2 | 3 | 3 | 5 | 6 | 6 |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Charge (£) | 60 | 80 | 104 | 116 | 128 | 140 | 160 |

(a) Plot the data on the scatter graph below.

(b) Describe the correlation.
$\qquad$
$\qquad$
(c) Draw a line of best fit on the scatter graph.
(d) Use your line of best fit to estimate the charge for a 4 hour job.
£. $\qquad$
(e) Explain why it may not be appropriate to use your line of best fit to estimate the charge for a job lasting 12 hours.
$\qquad$
$\qquad$
50. The number of hours of sunshine on a day, across a number of cities is shown below.

(a) How many more hours of sunshine was there in Norwich than Belfast?
$\qquad$ hours

In Glasgow there was 9 hours of sunshine.
(b) Complete the pictogram.

124 people took part in a talent show.
51. Each person either sang or danced.

76 of the people were singers.
14 people made it through to the final and the rest were eliminated. 6 dancers made it through to the final.

Complete the frequency tree

a) Complete the frequency tree
b) What fraction of the singers made it through to the final?
52.


Work out the distance between the town and the beach.
State your units.
53. Shown below is a right-angled triangle.


The area of the triangle is $21 \mathrm{~cm}^{2}$
Calculate $y$, the length of the base.
54. Shown below is a regular pentagon.

(a) Find the size of each interior angle.

$$
x=
$$



Three identical regular pentagons are joined as shown above.
(b) Work out the size of angle $y$.

$$
\begin{aligned}
& y= \\
& \text {... }{ }^{0}
\end{aligned}
$$

55. 



DEF is a straight line.
$C E=C F$.
Angle ECF is $40^{\circ}$.
Angle DCE is $15^{\circ}$.
Find the size of the angle marked $y$.
$\qquad$
0
56. A car travels 240 kilometres in 3 hours 45 minutes

Calculate the average speed, in km/h, of the car.
$\qquad$
57. The time for ten students to complete a race is below.

| Time (t seconds) | Frequency |
| :---: | :---: |
| $20<\mathrm{t} \leq 40$ | 3 |
| $40<\mathrm{t} \leq 60$ | 5 |
| $60<\mathrm{t} \leq 80$ | 2 |

Work out an estimate for the mean time taken.
58. Here is a Venn diagram.


A number is chosen at random.
(a) Write down $P(A \cap B)$
$\qquad$
(b) Write down $\mathrm{P}(\mathrm{A} \cup B)$
59. Jennifer is playing darts.

She throws two darts aiming for a Bullseye.
The probability Jennifer hits the Bullseye on her first throw is $1 / 4$.
The probability she hits the Bullseye on her second throw $1 / 3$.
(a) Complete the tree diagram.

First throw

> Second throw

(b) Work out the probability Jennifer hits the Bullseye at least once.
60. James is going on holiday in New York. James changes $£ 400$ into dollars (\$).

The exchange rate is $£ 1=\$ 1.38$

Work out how many dollars (\$) James will receive.
61. On the grid, draw $y=4 x-5$ for values of $x$ from -2 to 2 .

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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(4)
62. A fish tank sprung a leak and loses $20 \%$ of its water.

There is now 240 litres of water in the fish tank.
How much water was in the fish tank before the leak?
$\qquad$
63. A piece of carpet is 240 cm long.

Mr Jones cuts it into three pieces in the ratio 1:2:5
Work out the length of the longest piece of carpet.
64. Peter's weight decreases from 80 kg to 64 kg .

Calculate the percentage decrease in Peter's weight.
65. Work out

66. Expand and simplify $(w-6)(w+7)$
67. Solve $4 y+1=29-2 y$

$$
y=
$$

68. Work out the $n$th term for this sequence

$$
\begin{array}{lllll}
12 & 22 & 32 & 42 & 52
\end{array}
$$

69. Factorise fully

$$
9 m^{2}-12 m p
$$

70. 

Factorise $\mathrm{x}^{2}+4 \mathrm{x}-12$
71. A straight line $L$ is shown on the grid.


Work out the equation of line $L$
72. Solve the inequality $4 x+6 \geq 8$
73. Shown below is a conversion to change between kilograms and pounds.

(a) Using the graph, convert 5 kilograms to pounds.
$\qquad$
(b) Using the graph, convert 8 pounds to kilograms.
$\qquad$

A piano weighs 150 kilograms.
(c) Change 150 kilograms to pounds.
$\qquad$
74. Factorise $x^{2}-121$
75. Sebastian leaves $£ 3000$ in the bank for two years. It earns compound interest of $2 \%$ per year.

Calculate the total amount Sebastian has in the bank at the end of the two years.
$\qquad$
76. Write the following numbers in standard form.
(a) 40000
(b) 5600
(c) 41200000
(d) 0.00000008
77. (a) Complete the table of values for $y=x^{3}+2 x^{2}-1$

| $x$ | -3 | -2 | -1 | 0 | 1 | 2 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $y$ |  |  |  |  |  |  |

(b) On the grid, draw the graph of $y=x^{3}+2 x^{2}-1$ for the values of $x$ $-3 \leq x \leq 2$

78. Complete the table of values for $y=\frac{5}{x}$

| $x$ | 0.5 | 1 | 2 | 4 | 8 | 10 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $y$ |  |  |  |  |  |  |

(b) On the grid, draw the graph of $y=\frac{5}{x}$ for $0.5 \leq x \leq 10$

79. In the diagram $A B$ is parallel to $C D$.

(a) Work out the size of the angle marked $x$.

Give a reason for your answer.
$\qquad$
(b) Write down the value of y .
$\qquad$ .. ${ }^{\circ}$

Give a reason for your answer.
$\qquad$
80. Using ruler and compasses, construct the bisector of angle ABC.

81. $A$ and $B$ are two points.

## A



Shade the region which contains those points which are both closer to A than to $B$, and less than 5 cm from $B$.
82.


Work out the surface area of this cuboid.
State the units of your answer.
83. What is the volume of a piece of metal that has a mass of 300 g and density of $6 \mathrm{~g} / \mathrm{cm}^{3}$ ?
. $\mathrm{cm}^{3}$
84.

Find the pressure exerted by a force of 240 newtons on an area of $30 \mathrm{~cm}^{2}$. Give your answer in newtows $/ \mathrm{m}^{2}$
85. Shown below is a triangular prism.


Find the volume of the triangular prism.
86. Shown below is a rectangle drawn on a coordinate grid.


Enlarge the rectangle by scale factor 2 , using centre of enlargement $(-1,0)$.
(3)
87. Shown below is a circle with radius 10 cm .


Work out the circumference of the circle.
Give your answer in terms of $\pi$.
88. Here are the front elevation and plan view of a solid shape.

(a) On the grid, draw the side elevation.

(b) Draw a sketch of the solid shape.
89. Shown is the plan of a small field.


Thomas is going to keep some chickens in the field.
Each chicken needs $5 \mathrm{~m}^{2}$.

Work out the greatest number of chickens Thomas can keep in the field.
90. Below is a cylinder with diameter 8 cm and height of 10 cm .


Find the volume of the cylinder.
$\mathrm{cm}^{3}$
91. The diagram shows a right-angled triangle.


Calculate the length of $x$.
92. A semi-circle has diameter 20 cm .


Calculate the perimeter of the semi-circle.
93. Shown is a major sector of a circle.


Find the area of the major sector.
94. Shown is a sphere with radius 6 cm .

Surface area of sphere $=4 \pi r^{2}$


Calculate the surface area of the sphere.
95. A cone has base diameter 18 cm . The height of the cone is 20 cm .

Calculate the volume of the cone.

Volume of cone $=\frac{1}{3} \pi r^{2} h$
Curved surface area of cone $=\pi r l$

96. Given

$$
a=\binom{6}{-4} \quad b=\binom{-2}{1}
$$

Work out $\mathbf{2 a}+\mathbf{b}$
97.


Reflect shape A in the line $x=4$
Label the new shape B.
98.


Rotate shape A $180^{\circ}$ about centre $(-1,2)$
99.

For each pair below, state the condition why they are congruent.
(a)


Condition: $\qquad$
(b)


Condition: $\qquad$
(c)


10 cm


Condition: $\qquad$


Triangle $A B C$ is similar to triangle $A D E$.
$A B=6 \mathrm{~cm}$
$B C=8 \mathrm{~cm}$
$C E=6.25 \mathrm{~cm}$
$D E=18 \mathrm{~cm}$
(a) Work out the length of DB.
(b) Work out the length of AC.
101. (a) Complete the table of values for $y=x^{2}+x$

| $x$ | -3 | -2 | -1 | 0 | 1 | 2 | 3 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $y$ | 6 |  | 0 |  | 2 | 6 |  |

(2)
(b) On the grid, draw the graph of $y=x^{2}+x$ for the values of $x$ from -3 to 3 .

(2)
102. Solve the simultaneous equations

$$
\begin{aligned}
& 3 x+5 y=1 \\
& 2 x-3 y=7
\end{aligned}
$$

Do not use trial and improvement

$$
x=. . . . . . . . . . . . . . . . . . . . . . . . ~ y ~ y ~=~
$$

103. 

## $v=u+10 t$

(a) Work out the value of $v$ when $u=4$ and $t=3$

$$
v=
$$

(b) Make $u$ the subject of the formula

## $v=u+10 t$

$$
u=
$$

$\qquad$
(c) Make $t$ the subject of the formula


$$
t=
$$

104. A rectangle is shown below.

(a) Explain why $4 x+1=2 x+9$
$\qquad$
$\qquad$
(b) Find the size of $x$.
x = .......................cm
(c) Work out the area of the rectangle.
105. 



The lines $A$ and $B$ are parallel.
The line A passes through the point $(0,8)$
The line $B$ has equation $y=3 x+1$
Write down the equation of line $A$
106. The table gives information about the dogs in a village

| Breed | Frequency |
| :---: | :---: |
| Spaniel | 11 |
| Poodle | 7 |
| Greyhound | 4 |
| Jack Russell | 14 |

Draw an accurate pie chart to show this information.

107.
(a) Simplify
(b) Simplify

$$
m^{8} \div m^{2}
$$

(c) Simplify
$\left(m^{3}\right)^{2}$
108. Write down the exact value of $\operatorname{Cos} 60^{\circ}$
109. Below is rectangle, $A B C D$

$A D=5 \mathrm{~cm}$
$B D=13 \mathrm{~cm}$
Calculate the perimeter of rectangle $A B C D$
110. A circle has an area of $64 \mathrm{~cm}^{2}$

Work out the radius of the circle.
111. The diagram shows the position of two people, $A$ and $B$, who are on their Duke of Edinburgh expedition.


## A

The bearing of person $C$ from person $A$ is $062^{\circ}$ The bearing of person $C$ from person $B$ is $275^{\circ}$

In the space above, mark the position of person $C$ with a cross $(x)$. Label it $C$.
112.


15 cm

Calculate the area of the trapezium.
113. Nigel measures the time, $t$ seconds, to complete a race as 14.8 seconds correct to the nearest tenth of a second.

Write down the error interval for t .
114. Candles normally cost $£ 6$ each.

Two websites have special offers

| Corbettmaths Candles | Candles'R'us |
| :---: | :---: |
| Buy 3 get 1 free | $20 \%$ off |

Laura wants to buy 30 candles.
Which website should Laura use?
(4)
115. Calculate the value of

$$
\sqrt[3]{(25.4-5.9)^{2}}
$$

(a) Write down your full calculator display.
$\qquad$
(b) Give your answer to three significant figures.
116. Felicity has two boxes of counters, each with an equal ratio of black and white beads.

In box A, 54 of the beads of black and 36 are white.
There are 162 white beads in box $B$.
How many beads are there in the two boxes in total?

