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Q&A Booklet:
Key Facts to Memorise
Broad General Education Booklet 4

Ways of using this booklet:

1) Write the questions on cards with the answers on the back and **test yourself**.
2) **Work with a friend** who is also doing National 3 Applications to take turns reading a random question and answering.
3) **Ask a friend or family member** to test you by reading questions (on the left-hand side) to you.

The questions are on the left-hand side of each page and the answers are on the right.

Times Table Facts	
1) What is 6 × 6?	36
2) What is 6 × 7?	42
3) What is 6 × 8?	48
4) What is 6 × 9?	54
5) What is 7 × 7?	49
6) What is 7 × 8?	56
7) What is 7 × 9?	63
8) What is 8 × 8?	64
9) What is 8 × 9?	72
10) What is 9 × 9?	81
11) What is 36 ÷ 6?	36
12) What is 42 ÷ 7?	6
13) What is 48 ÷ 8?	6
14) What is 54 ÷ 9?	6
15) What is 49 ÷ 7?	7
16) What is 56 ÷ 8?	7
17) What is 63 ÷ 9?	7
18) What is 64 ÷ 8?	8
19) What is 72 ÷ 9?	8
20) What is 81 ÷ 9?	9
21) What is 3 squared?	9
22) What is 4 squared?	16
23) What is 5 squared?	25
24) What is 6 squared?	36
25) What is 7 squared?	49
26) What is 8 squared?	64
27) What is 9 squared?	81
28) What is 10 squared?	100
29) What is the square root of 9?	3
30) What is the square root of 16?	4
31) What is the square root of 25?	5
32) What is the square root of 36?	6
33) What is the square root of 49?	7
34) What is the square root of 64?	8
35) What is the square root of 81?	9
36) What is the square root of 100?	10

Surds and Indices	
37) What is 2 cubed?	8
38) What is the cube root of 8?	2
39) What is 3 cubed?	27
40) What is the cube root of 27?	3
41) What is 4 cubed?	64
42) What is the cube root of 64?	4
43) What is 5 cubed?	125
44) What is the cube root of 125?	5
45) What is 10 cubed?	1000
46) What is the cube root of 1000?	10
47) What is the answer when any number is raised to the power of zero?	1
48) What is the answer when any number is raised to the power of one?	The same number
49) What does a negative power mean?	Divide ***Alternative answer:*** the answer is a fraction

Fractions	
50) How do you calculate a fraction of an amount?	Divide by the bottom and multiply by the top
51) How do you change a fraction into a decimal using a calculator?	Top number divided by bottom number
52) How do you add or subtract two fractions with the <u>same</u> numbers on the bottom?	Keep the numbers on the bottom the same, and add the numbers on the top.
53) What is the proper name for the number on <u>top</u> of a fraction?	Numerator
54) What is the proper name for the number on the <u>bottom</u> of a fraction?	Denominator
55) How do you add or subtract two fractions with <u>different</u> numbers on the bottom?	The “kiss and smile” method.
56) Which two types of sums with fractions do you use the “kiss and smile” method?	Add and take away

57) Which two types of sums with fractions do <u>not</u> use the "kiss and smile" method?	Multiply and divide
58) How do you multiply two fractions?	Multiply the two top numbers, multiply the two bottom numbers
59) How do you divide two fractions?	Flip the second fraction upside down and change the divide to multiply

Percentages	
60) What percentage is the same as the fraction one-third?	$33\frac{1}{3}\%$
61) What percentage is the same as the fraction two-thirds?	$66\frac{2}{3}\%$
62) How do you find $33\frac{1}{3}\%$ of a number?	Divide by 3 ***Alternative answer:*** find one-third of it
63) How do you find $66\frac{2}{3}\%$ of a number?	Divide by 3 and multiply by 2 ***Alternative answer:*** find two-thirds of it
64) What do you do to work out 30% without a calculator?	Divide by 10 and multiply by 3 ***Alternative answer:*** find 10% and times by 3
65) What sum do you do to work out 70% without a calculator?	Divide by 10 and multiply by 7 ***Alternative answer:*** find 10% and times by 7
66) What sum do you do to work out 3% without a calculator?	Divide by 100 and multiply by 3 ***Alternative answer:*** find 1% and times by 3
67) What sum do you do to work out 5% without a calculator?	Divide by 100 and multiply by 5 ***Alternative answer:*** find 1% and times by 5 ***Alternative answer:*** find 10% and half it

Negative Numbers	
68) To add a negative number do you count up or down?	Down
69) To add a positive number do you count up or down?	Up
70) To subtract a positive number do you count up or down?	Down
71) To subtract a negative number do you count up or down?	Up
72) How do you subtract a negative number?	The sum becomes an add
73) When you multiply one negative number and one positive number is the answer negative or positive?	Negative
74) When you multiply two negative numbers is the answer negative or positive?	Positive
75) When you square a negative number is the answer negative or positive?	Positive
76) When you divide one negative number and one positive number is the answer negative or positive?	Negative
77) When you divide two negative numbers is the answer negative or positive?	Positive

Algebra	
78) What does **evaluate** mean?	Do the sum
79) What does **factorise** mean?	Put the brackets back in
80) When writing a formula from a table of values, how do you find the number you multiply by?	Look at the bottom row of the table and identify the number you are 'going up' in
81) What is the key rule for solving **equations**?	Move to the other side and do the opposite
82) If a straight line is **horizontal** through the number a, how do you write its equation?	$y = a$
83) If a straight line is **vertical** through the number b, how do you write its equation?	$x = b$

Statistics	
84) If you are asked to draw a **frequency table**, what does this mean?	A tally chart
85) How do you find the **mean**?	a) Add all the numbers together b) Divide by how many numbers there are
86) How do you find the **range**?	Highest take away Lowest
87) How do you find the **mode**?	The most frequent number
88) How do you find the **median**?	The middle number
89) What do you have to do <u>before</u> you can find the median?	Put the numbers in order
90) If a **mean, median or mode is higher**, what comment can you make?	On average the numbers are higher
91) If a **mean, median or mode is lower**, what comment can you make?	On average the numbers are lower
92) If a **range is higher**, what comment can you make?	The numbers are more varied
93) If a **range is lower**, what comment can you make?	The numbers are more consistent
94) In a scatter graph, does a line of best fit need to go through the origin?	No
95) If a scatter graph question asks you to 'estimate' what do you do?	Use your line of best fit to read off the graph
96) How do you calculate the angles needed for a pie chart?	360 divided by the 'total' multiplied by the frequency for that 'slice'

Measurement	
97) How do you change **centimetres** to **metres**?	Divide by 100
98) How do you change **metres** to **centimetres**?	Multiply by 100
99) How do you change **kilometres** to **metres**?	Multiply by 1000
100) How do you change **metres** to **kilometres**?	Divide by 1000
101) How do you change **centimetres** to **millimetres**?	Multiply by 10
102) How do you change **millimetres** to **centimetres**?	Divide by 10
103) How do you change **grams** to **kilograms**?	Divide by 1000
104) How do you change **kilograms** to **grams**?	Multiply by 1000
105) How do you change **kilograms** to **tonnes**?	Divide by 1000
106) How do you change **tonnes** to **kilograms**?	Multiply by 1000
107) How do you change **millilitres** to **litres**?	Divide by 1000
108) How do you change **litres** to **millilitres**?	Multiply by 1000
109) How many **centimetres cubed** are in a **litre**?	1000
110) How do you change **centimetres cubed** to **litres**?	Divide by 1000
111) How do you change **litres** to **centimetres cubed**?	Multiply by 1000

Angle	
112) What do the three angles in a **triangle** always add up to?	180 degrees
113) What do the four angles in a **quadrilateral** always add up to?	360 degrees
114) What is a tangent to a circle?	A line that just touches the edge of the circle at one point
115) When you have a circle diagram including a tangent, what can you say about angles?	The angle between the tangent and the radius is a right angle
116) What do you know about the angle in a semicircle?	It is a right angle
117) In which two places can you find right angles in circle diagrams?	1) Between a tangent and radius 2) Angle in a semicircle

Perimeter, Area Volume	
118) When do you use **squared units** e.g. centimetres squared (cm²) or metres squared (m²)?	When you are working out an area **Alternative answer:** when the formula begins "*A* ="
119) When do you use **cubed units** e.g. metres cubed (m³) or centimetres cubed (cm³)?	When you are working out a volume **Alternative answer:** when the formula begins "*V* ="
120) What is the formula for the volume of a **cuboid**?	Length times Breadth times Height **Alternative answer:** $V = LBH$
121) What is the formula for the area of a **rectangle**?	Length times Breadth **Alternative answer:** $A = LB$
122) How do you find the area of a **triangle**?	Half Base times Height **Alternative answer:** $A = \frac{BH}{2}$ **(A equals B H over 2)**
123) How do you find the **perimeter** of any shape?	Add all the outside lengths together
124) What is the formula for the **area** of a circle?	$A = \pi r^2$ **(A equals pi r squared)**
125) What is the formula for the **circumference** of a circle?	$C = \pi d$ **(C equals pi d)**
126) If you are told the radius, how do you find the **diameter** of a circle?	Double it
127) If you are told the diameter, how do you find the **radius** of a circle?	Half it
128) How do you find the volume of a **prism**?	a) Find the area of the end b) Multiply by the height
129) What is the formula for the volume of a **cylinder**?	$V = \pi r^2 h$ **(V equals pi r squared h)**
130) What is the formula for the volume of a **cone**?	$V = \frac{1}{3}\pi r^2 h$ **(V equals one third pi r squared h)**
131) What is the formula for the volume of a **sphere**?	$V = \frac{4}{3}\pi r^3$ **(V equals four thirds pi r cubed)**
132) How do you find the **perimeter** of a shape with a curved edge?	a) Use $C = \pi d$ for the curved edge b) Add on any straight lengths

Time	
133) What is the formula for **speed**?	$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$ (or $S = \frac{D}{T}$)
134) What is the formula for **distance**?	$\text{Distance} = \text{Speed} \times \text{Time}$ (or $D = ST$)
135) What is the formula for **time taken**?	$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$ (or $T = \frac{D}{S}$)
136) How do you change minutes into hours using a decimal point?	Divide by 60
137) How do you change hours (with a decimal point) into minutes?	Multiply by 60

Direction and Scale	
138) From a scale drawing, how do you find the real-life length?	1) Measure with a ruler 2) Multiply by the number in the scale 3) Write units on the end of your answer
139) What two things do you need to remember when drawing or measuring a **three-figure bearing** on a diagram?	1) Must start with zero at North 2) Must measure clockwise
140) From a real-life situation, how do you find the length to draw in a scale drawing?	Divide by the number in the scale
141) From a scale drawing, how do you find the real-life length?	Multiply by the number in the scale

Probability	
142) How can you decide which probability is most likely?	Change all probabilities to a percentage and choose the largest one.
143) How do you change a probability from a fraction to a percentage?	Top number divided by bottom number multiplied by 100.

Money	
144) What type of sum do you do to work out a **discount**?	Take away
145) What does **income** mean?	The money you get in
146) What does **expenditure** mean?	The money you spend
147) How do you work out **Total Expenditure**?	Add all the numbers together
148) What sum do you do with income and expenditure to work out how much money is left over?	Income take away expenditure
149) Give examples of **deductions** from pay?	Tax, National Insurance, Pension etc.
150) What does **gross pay** mean?	The amount you get paid before deductions are taken off
151) What does **net pay** mean?	The amount you get paid after deductions are taken off
152) How do you work out net pay?	Take the Deductions away from the Net Pay
153) How do you work out how much somebody gets paid when you know how many hours they have worked?	Hourly pay × number of hours
154) If you get **time-and-a-half** for overtime, what do you multiply the pay by?	1·5
155) If you get **double time** for overtime, what do you multiply the pay by?	2
156) What are the three steps to find **monthly instalments** on a loan?	1) Calculate the interest as a percentage 2) Add on the interest to the original amount 3) Divide by the number of months
157) When using exchange rates, how do you decide whether to **multiply** or **divide**?	Multiply when changing into foreign money, divide when changing back into pounds.

Shape	
158) What are the three steps involved in a **Pythagoras** question?	1) Square 2) Add or take away 3) Square root
159) When do you choose to **add** in a Pythagoras question?	If the side you are finding is the longest one
160) When do you choose to **take away** in a Pythagoras question?	If the side you are finding is a shorter one
161) How do you calculate a gradient?	Vertical distance divided by horizontal distance
162) If a question has the **opposite** and **hypotenuse**, do you use sin **(pronounced sine)**, cos or tan?	sin
163) If a question has the **adjacent** and **opposite**, do you use sin **(pronounced sine)**, cos or tan?	tan
164) If a question has the **hypotenuse** and **adjacent**, do you use sin **(pronounced sine)**, cos or tan?	cos
165) What is the formula for **tan**?	$\tan x = \frac{\text{opposite}}{\text{adjacent}}$ **(tan x equals opposite over a**
166) What is the formula for **sin**? **(pronounced sine)**	$\sin x = \frac{\text{opposite}}{\text{hypotenuse}}$ **(sine x equals opposite over hyp**
167) What is the formula for **cos**?	$\cos x = \frac{\text{adjacent}}{\text{hypotenuse}}$ **(cos x equals adjacent over hyp**
168) When do you use the SHIFT button on the calculator in a SOH CAH TOA question?	To find an angle
169) A SOH CAH TOA question asks you to find the angle: what are the two main steps?	1) Divide 2) use shift (or inverse) sin/cos/tan
170) A SOH CAH TOA question asks you to find a length: what are the two main steps?	1) Multiply by the number on the bottom 2) Use normal sin/cos/tan
171) How do you know whether to use SOH CAH TOA or Pythagoras?	If there is an angle in the question, you use SOH CAH TOA. If its only lengths, you use Pythagoras.