GRADEUP

AQA (GCSE Notes)

Chapter 1: Number

Q1. Arrange the following numbers in ascending order: -3.7, 2 ¾, -2 ½, 3.6, 0.

Q2. Write the numbers ⅞, 0.86, and 7/10 in descending order.

Q3. Determine whether -4.5 > -9/2 is true or false using appropriate justification.

Q4. Compare -1.2 and -6/5 using the correct inequality sign.

Q5. Place the following numbers on a number line: -2.4, -1¾, 0, 1.25, 3⅓.

Q6. Write the following numbers in order from smallest to largest: -0.25, 1/3, -2/5, 0.1.

Q7. Identify which number is greater: -7.6 or -7 ½.

Q8. Convert the following mixed numbers to improper fractions and compare them: 3 ⅓ and 10/3.

Q9. Fill in the blank with the correct symbol (=, ≠, <, >, ≤, ≥): -8/3 ___ -2.6.

Q10. Which is greater: 5.06 or 5.0601? Show how place value supports your answer.

Q11. Multiply: -4 × 3.2

Q12. Divide: -36 ÷ 4.5

Q13. Subtract: -3 ½ – 1 ¼

Q14. Add: -2.5 + 3 ¾

Q15. Simplify the expression: -6 + 4 – 3.2 + 1.7

Q16. Evaluate: ⅝ × (–16)

Q17. Calculate the product of -3 ⅓ and 2 ½

Q18. Perform the division and give the answer as a mixed number: -7 ÷ 1¼

Q19. Add the following: -5 ¾ + (-2 ⅓)

Q20. Multiply the following decimals: -1.5 × 0.06

Q21. Subtract -3.2 from 1.7

Q22. Evaluate: (-2 ⅔) + (4 ⅓)

Q23. Multiply: -⅔ × ¾

Q24. Divide: 4.2 ÷ (-0.3)

Q25. Simplify and evaluate: (-2 ½) – (-1 ⅓)

Q26. Add together: 0.125 + 1/8 + ⅜

Q27. Find the difference: 6 – 10.35

Q28. Perform: (-12.6) ÷ (–0.9)

Q29. Evaluate the expression: (5.2 – 9.6) + (3.4)

Q30. Subtract a negative number: 8.7 – (–1.3)

Q31. Compare and fill the blank: 0.00045 ___ 0.0045

Q32. Convert and compare: Write 0.6 as a fraction and compare it with ⅝

Q33. Calculate: -2.25 + 3.6 – 5.4

Q34. Use formal written methods to divide 7.84 by 0.4

Q35. Use place value to determine the value of the digit 7 in the number 407.062

Q36. Multiply -0.02 by 10,000 and explain the shift in place value

Q37. Divide: 0.00072 ÷ 0.00009

Q38. Round 0.008673 to 2 decimal places and explain the reasoning

Q39. Add: -1.32 + 0.8 + (-3.5)

Q40. Subtract: -0.625 – 0.25

Q41. Evaluate the expression using brackets: (-3.5 + 1.2) × 4

Q42. Multiply the mixed numbers: 1 ⅓ × (-3 ⅔)

Q43. Simplify the following: -4/5 × 10

Q44. Write the decimal 0.00036 in standard form

Q45. Convert the fraction 11/8 into a decimal and then compare it to 1.4

Q46. Compare and justify using place value: 6.705 ___ 6.750

Q47. Multiply: 0.004 × (-0.6)

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Q48. Divide a negative by a positive: $-81 \div 9$

Q49. Use long multiplication to calculate: -12.4×3.1

Q50. Write 3.075 in words, and identify the place value of each digit

Q51. Simplify the expression: $(3^2 + 4) \times (12 \div 3) - 5$

Q52. Given that $72 = 2^3 \times 3^2$, write down the prime factorisation of 144 in index form.

Q53. Find the lowest common multiple (LCM) of 18 and 24 using prime factorisation.

Q54. Two numbers have a highest common factor (HCF) of 6 and a lowest common multiple (LCM) of 120. If one of the numbers is 24, find the other.

Q55. Without using a calculator, evaluate the expression: $\sqrt{(4^2 + 3^2)}$

Q56. If $a \times b = 36$ and $b = 9$, use the inverse operation to find the value of a.

Q57. Expand and simplify: $5(2x - 3) - 3(x - 4)$

Q58. Write 210 as a product of its prime factors using index notation.

Q59. A number is divisible by both 12 and 18. What is the smallest possible value of this number?

Q60. Use the unique factorisation theorem to find the HCF of 84 and 126.

Q61. Simplify the expression by cancelling common factors: $(14x^2 - 21x) \div (7x)$

Q62. Given that $x = 5$, evaluate the expression: $2x^2 - 4x + 3$

Q63. If $3(x + 2) = 2(2x - 1)$, solve for x.

Q64. The reciprocal of a number is $\frac{2}{3}$. What is the original number?

Q65. Simplify the following using the laws of indices: $(2^3 \times 2^4) \div 2^2$

Q66. Evaluate the expression: $[5 + 3 \times (2^2)] - 6$

Q67. Find the value of x in the equation: $x^2 = 121$

Q68. Using product notation, express the prime factorisation of 1000

Q69. Explain why the square root of a prime number is always irrational

Q70. The HCF of two numbers is 15 and their LCM is 180. If one number is 45, determine the other using the relationship between HCF, LCM and product of two numbers.

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Q71. List all the different two-digit numbers that can be made using the digits 3, 5, and 7, without repeating digits.

Q72. How many different ways can you arrange the letters in the word "CUBE"?

Q73. Simplify: $2^4 \times 2^3$

Q74. Simplify: $(3^2)^3$

Q75. Write down the value of 5^0

Q76. Calculate the exact value of 64^(1/3)

Q77. Without using a calculator, work out the value of 4^(3/2)

Q78. Simplify: $(\sqrt{5})^2$

Q79. Simplify: $3\sqrt{2} + 2\sqrt{2}$

Q80. Simplify: $\sqrt{50}$

Q81. Write $\sqrt{12}$ in its simplest surd form

Q82. Rationalise the denominator: $3 / \sqrt{2}$

Q83. Rationalise and simplify: $4 / \sqrt{5}$

Q84. Simplify: $(\sqrt{3})^2 + \sqrt{9}$

Q85. Expand and simplify: $(\sqrt{2} + \sqrt{3})^2$

Q86. Simplify the expression: $(2\sqrt{3})(5\sqrt{6})$

Q87. Simplify: $\sqrt{a} \times \sqrt{b}$

Q88. Simplify and give your answer in terms of surds: $\sqrt{(27 \times 12)}$

Q89. Write 8^(2/3) as a surd

Q90. Simplify: (16)^(3/4)

Q91. Evaluate: (81)^(1/4)

Q92. Simplify: (x^3)^(1/2)

Q93. Work out the exact value of $\pi \times 6^2$

Q94. Give an exact value for the area of a circle with radius 3 cm, in terms of π

Q95. Calculate exactly: $(2/3)^2$

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Q96. Simplify: $(x^2 \times x^3) / x^4$

Q97. Simplify fully: $5\sqrt{18} - \sqrt{50}$

Q98. Expand and simplify: $(\sqrt{3} + 1)(\sqrt{3} - 1)$

Q99. Simplify: $(x^{(1/2)})^2$

Q100. Express $125^{(2/3)}$ as a whole number

Q101. Simplify: $\sqrt{(a^2)}$

Q102. Simplify: $a^{(1/2)} \times a^{(1/3)}$

Q103. Expand and simplify: $(2 + \sqrt{5})(2 - \sqrt{5})$

Q104. Work out the cube root of 0.008

Q105. Simplify: $1 / \sqrt{8}$

Q106. Rationalise the denominator and simplify: $5 / (2\sqrt{3})$

Q107. Simplify: $(9x^2)^{(1/2)}$

Q108. Evaluate: $x^{(3/2)} / x^{(1/2)}$

Q109. Write the number 64 as a power of 4

Q110. Simplify: $(\sqrt{27} + \sqrt{3})^2$

Q111. Simplify: $\sqrt{(3^2 + 4^2)}$

Q112. Calculate exactly: $\pi \times 12$

Q113. Simplify: $(x^{(2/3)})^3$

Q114. Simplify: $(x^{(1/4)})^2$

Q115. Express 32 as a power of 2

Q116. Write down all the square numbers less than 100

Q117. Simplify: $\sqrt{48} + \sqrt{75}$

Q118. Rationalise the denominator and simplify: $(6 + \sqrt{2}) / \sqrt{2}$

Q119. Simplify: $\sqrt{(2a)} \times \sqrt{(8a)}$

Q120. Expand and simplify: $(x + \sqrt{2})(x - \sqrt{2})$

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Q121. Express 3,600,000 in standard form.

Q122. Write 7.25×10^{-3} as an ordinary number.

Q123. A car travels 3.2×10^{5} metres in 4×10^{2} seconds. Work out the average speed in standard form.

Q124. Multiply (6.4×10^{4}) by (5×10^{3}) and give your answer in standard form.

Q125. Divide (8.1×10^{6}) by (3×10^{2}) and write the answer in standard form.

Q126. A bacteria population doubles every hour. Initially, there are 4.5×10^{3} bacteria. How many will there be after 3 hours? Give your answer in standard form.

Q127. Convert 0.875 into a fraction in its simplest form.

Q128. Write 11/4 as a decimal.

Q129. A drink contains 0.6 litres of water. Express this as a fraction of a litre.

Q130. Convert the recurring decimal 0.333... into a fraction.

Q131. A chocolate bar weighs 0.375 kg. Express this weight as a fraction in its simplest form.

Q132. Write 2 3/8 as a decimal.

Q133. A packet contains 0.25 kg of nuts. If each serving is 1/8 kg, how many servings are there?

Q134. Convert the decimal 1.2 into a mixed number.

Q135. Express 5/6 as a decimal, giving your answer to 3 decimal places.

Q136. Divide £2.40 between Alice and Ben in the ratio 3:5. How much does each receive?

Q137. Simplify the ratio 6/10 : 9/15

Q138. Divide 42 grams of gold into the ratio 1/3 : 2/3.

Q139. A recipe uses 3/4 of a cup of sugar to 1/2 a cup of oil. Write this as a ratio in its simplest form.

Q140. Divide 500ml of a drink in the ratio 2/5 : 3/5.

Q141. There are 36 students in a class. The ratio of boys to girls is 5/9 : 4/9. How many boys are there?

Q142. A map uses the ratio 1:50,000. What is the actual distance (in km) represented by 3.2 cm on the map?

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Q143. Increase 120 by 15%.

Q144. Decrease £180 by 20%.

Q145. A coat is reduced in a sale by 30%. If the sale price is £84, what was the original price?

Q146. A bank pays 2% interest annually. How much interest is earned on £450 over one year?

Q147. 25% of a number is 60. What is the number?

Q148. 80 is what percentage of 320?

Q149. Express 48 as a percentage of 80.

Q150. A factory increases its production by 12% each year. If it produced 5,000 units this year, how many will it produce next year?

Q151. A worker earns £9.60 per hour. How much does she earn in 37.5 hours?

Q152. A bag of flour weighs 2.5 kg. How many 0.2 kg loaves can be made from it?

Q153. Convert 1.75 metres into centimetres.

Q154. A journey takes 2.5 hours. Express this time in minutes.

Q155. Convert 0.85 litres into millilitres.

Q156. A container holds 2.4 litres of water. How many 300 ml cups can be filled?

Q157. A car travels 180 km in 2.5 hours. Calculate its average speed in km/h.

Q158. A sprinter runs 100 metres in 9.58 seconds. Calculate their average speed in m/s.

Q159. A rectangle has length 2.4 m and width 1.5 m. Find its area in m^2.

Q160. A water tank has a volume of 1.2 m^3. Convert this volume to litres.

Q161. A cyclist covers 36 km in 1.5 hours. What is their speed in m/s?

Q162. A van travels 225 miles in 3.75 hours. Find its average speed in mph.

Q163. Convert 5 minutes 30 seconds into seconds.

Q164. A recipe needs 0.75 kg of flour. You only have 375 g. What fraction of the required flour do you have?

Q165. A road is 2.8 miles long. Convert this length into kilometres (1 mile = 1.609 km).

Q166. A tank fills at a rate of 1.5 litres per second. How much water will it contain after 4 minutes?

Q167. A car uses 45 litres of fuel to travel 540 km. Calculate its fuel efficiency in km/litre.

Q168. A rectangular field is 0.5 km long and 300 m wide. Find the area in m².

Q169. Convert 0.0045 m to millimetres.

Q170. A person earns £2,500 per month. Calculate their annual income.

Q171. Estimate the value of 49.3 × 0.81 by rounding each number to 1 significant figure.

Q172. Without using a calculator, estimate the value of √82 by comparing it with two nearby square numbers.

Q173. Round 0.04856 to 2 significant figures.

Q174. Round 6.295 to 2 decimal places.

Q175. Round 13,475 to the nearest hundred.

Q176. A length is measured as 7.56 cm to the nearest 0.01 cm. Write the error interval for the actual length.

Q177. A car's mass is recorded as 1,350 kg to the nearest 10 kg. State the lower and upper bounds for the mass.

Q178. The width of a table is given as 85.3 cm, measured to the nearest 0.1 cm. Write this measurement as an error interval using inequality notation.

Q179. A time is recorded as 3.6 s to 1 decimal place. State the upper bound for the time.

Q180. A temperature is recorded as -2.4°C to the nearest tenth of a degree. Write the error interval using inequality notation.

Q181. A student calculates 23.9 × 1.06 = 25.334. Use estimation to check if this result is reasonable.

Q182. A value is given as 2.938 to 3 decimal places. Round this to 2 significant figures.

Q183. Round the number 0.000849 to 2 significant figures.

Q184. A measurement is given as 12.08 cm. State the upper and lower bounds if it was rounded to the nearest 0.01 cm.

Q185. A mobile phone weighs 173 g to the nearest gram. Write the error interval for the weight.

Q186. A distance is measured as 2.7 km to 1 decimal place. Use inequality notation to write the error interval.

Q187. A box contains approximately 496 nails. Estimate how many nails would be in 25 such boxes.

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Q188. Use rounding to estimate the result of (23.7 × 4.9) ÷ 11.2

Q189. A machine cuts steel rods to a length of 52.3 cm. The actual lengths can vary by up to 0.2 cm. Write the range of possible lengths using inequality notation.

Q190. A student used a calculator to work out √(103 × 4.2). Check whether the answer 20.8 is reasonable by estimation.

Q191. Estimate the value of 38.6 ÷ 1.93 by rounding both numbers appropriately.

Q192. The capacity of a tank is recorded as 245 litres, rounded to the nearest 5 litres. Determine the lower and upper bounds for the capacity.

Q193. Round 0.006728 to 3 significant figures.

Q194. A measurement is recorded as 4.35 m to 2 decimal places. Use inequality notation to state the range within which the actual value lies.

Q195. A pencil is said to be 17.4 cm long to the nearest millimetre. Write the error interval.

Q196. A school recorded attendance as 94.6% to 1 decimal place. Give the error interval using inequalities.

Q197. A phone battery capacity is listed as 3000 mAh, rounded to the nearest 100 mAh. What are the upper and lower bounds?

Q198. Use estimation to check the result of (0.84 × 19.6) + (3.92 ÷ 0.19)

Q199. Round 8.6297 to 3 significant figures.

Q200. Round 563.48 to 1 significant figure.

Q201. A board is measured as 1.25 m wide. If it was rounded to the nearest 0.01 m, give its possible range using an inequality.

Q202. The area of a square is calculated as 25.6 cm², based on a rounded side length. Estimate the side length and check if the area is plausible.

Q203. A child's height is measured as 1.32 m to 2 decimal places. Write the upper and lower bounds using inequality notation.

Q204. A builder needs 15 planks, each 2.05 m long. Estimate the total length of wood required.

Q205. A laptop weighs 2.78 kg to 2 decimal places. Give the range of values it could actually weigh using inequalities.

Q206. A number is measured as 0.0048 to 2 significant figures. Write the number rounded to 1 significant figure.

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Q207. A recipe needs 0.62 litres of milk, measured to 2 decimal places. Write the error interval using inequalities.

Q208. Estimate the answer to 48.1 × 1.94 by rounding to 1 significant figure.

Q209. A square has a side length of 7.4 cm, measured to the nearest millimetre. Find the lower and upper bounds for the area.

Q210. A cuboid's dimensions are 12.3 cm, 4.5 cm, and 6.8 cm, all measured to the nearest 0.1 cm. Find the upper bound of the volume.

Q211. A student writes 3.4591 to 4 significant figures. What is the rounded number?

Q212. Round the number 0.0003784 to 2 significant figures.

Q213. A measurement is recorded as 42.0 m, rounded to the nearest metre. State the range of values it could represent using inequalities.

Q214. A time is recorded as 2 minutes 15 seconds. Estimate how many such times would occur in an hour.

Q215. A calculation gives 48.916 → round this to 3 decimal places.

Q216. A runner completes a lap in 53.78 seconds, rounded to the nearest hundredth. State the error interval using inequalities.

Q217. Round 49,672 to 2 significant figures.

Q218. Estimate the value of (1.96 × 17.3) ÷ 8.3 using 1 significant figure rounding.

Q219. The temperature was recorded as -1.8°C to the nearest 0.1°C. Write the error interval using inequalities.

Q220. A length is measured as 1.63 m to 2 decimal places. State the lower and upper bounds for the measurement.

Q221. Multiply 234 by 67 using a formal written method.

Q222. Divide 7325 by 25 using long division.

Q223. Add the fractions 5/8 and 3/4, giving your answer in its simplest form.

Q224. Subtract 7/10 from 11/15 and simplify the result.

Q225. Multiply 3/7 by 2/9 and express your answer in the lowest terms.

Q226. Divide 5/6 by 3/8 and simplify your answer.

Q227. Express 81^(1/4) as a simplified number.

Q228. Simplify (16)^(3/4)

Q229. Write 125^(-2/3) as a fraction in its simplest form.

Q230. Simplify the expression: (x^1/2) * (x^3/2)

Q231. State all the factors of 84.

Q232. Find the HCF and LCM of 60 and 96.

Q233. Determine whether 347 is a prime number, and explain your reasoning.

Q234. Write the number 0.333... as a fraction in its simplest form.

Q235. Which is larger: 3/7 or 4/9? Show your working.

Q236. Place the numbers -2.5, 0, 1/3, and -1/2 in ascending order.

Q237. Insert the correct symbol (>, <, =) between the following: 7/10 ___ 0.68

Q238. Write down a number that satisfies the inequality: $-3 < x \leq 2$

Q239. Write 4.507 in words and describe the place value of each digit.

Q240. Round 28,573 to the nearest hundred.

Q241. Identify the value of the digit 7 in the number 570,241.

Q242. Simplify: (2^3) × (2^4)

Q243. Evaluate: (3^2)^3

Q244. Simplify the expression: (5^4) ÷ (5^2)

Q245. Calculate: (2 × 3)^2

Q246. How many possible outcomes are there when flipping 3 coins?

Q247. In how many ways can the letters in the word “MATH” be arranged?

Q248. A password consists of 3 letters followed by 2 digits. How many different passwords are possible?

Q249. List all the possible outcomes when rolling a six-sided die and flipping a coin.

Q250. Write down all the integer values that satisfy: $-4 \leq x < 3$

Q251. Simplify: 3 + 4 × 2

Q252. Simplify: (5 + 3)^2 ÷ 4

Q253. Rewrite the expression 6 − 2 × (3 + 1) using BIDMAS.

Q254. Calculate: (7^2 − 5) ÷ (2 + 1)

Q255. Evaluate the expression: 2^4 + 3 × (6 − 4)

Q256. Express √49 as an integer.

Q257. Evaluate ∛64

Q258. Simplify: √(36) + √(81)

Q259. Simplify: 5^2 + 2^3

Q260. Calculate 2^5 × 4^2 using index laws.

Q261. Convert 3.6 × 10^4 into an ordinary number.

Q262. Write 0.00084 in standard form.

Q263. Express 3,750,000 in standard form.

Q264. Multiply (2.5 × 10^3) by (4 × 10^2) and give your answer in standard form.

Q265. Divide (6.3 × 10^5) by (3 × 10^2) and give your answer in standard form.

Q266. Simplify √50 + √18

Q267. Simplify the expression √12 − √3

Q268. Expand and simplify (√3 + √2)^2

Q269. Simplify: (3 + √2)(3 − √2)

Q270. List all the different 3-digit numbers that can be made using the digits 1, 4, and 6 without repetition.