AQA Level 3 Certificate MATHEMATICAL STUDIES

Paper 2A Statistical Techniques – Predicted 2026

Time allowed: 1 hour 30 minutes

Materials

- a clean copy of the Preliminary Material, Formulae Sheet and Statistical Tables (enclosed)
- a scientific calculator or a graphics calculator
- a ruler

Instructions

- Use black ink or black ball-point pen. Pencil should only be used for drawing.
- Fill in the boxes at the top of this page.
- Answer all questions.
- You must answer the questions in the spaces provided.
- Show all necessary working; otherwise marks for method may be lost.
- Do all rough work in this book. Cross through any work you do not want to be marked.
- Final answers should be given to an appropriate degree of accuracy.

Answer all questions in the spaces provided.

Question 1 **[6 marks]**

Use the Preliminary Material: *The Computer Games Market*.

(a) In the Preliminary Material Graph 1 the combined PC and console revenue in 2015 is shown as approximately \$62.2 billion and in 2021 as \$94.3 billion. Calculate the percentage increase in revenue from 2015 to 2021. [2]

(b) The forecast increase from 2023F to 2026F is \$13.4 billion and the 2023F revenue is \$94.0 billion. Calculate the percentage increase from 2023F to 2026F, correct to 2 decimal places. [2]

(c) Explain briefly what a CAGR of 4.5% from 2023F to 2026F means in context. [2]

Question 2 **[6 marks]**

Report A gives a forecast that the number of console players will increase by 9.3% in total from 2023F to 2026F, reaching 664 million in 2026F.

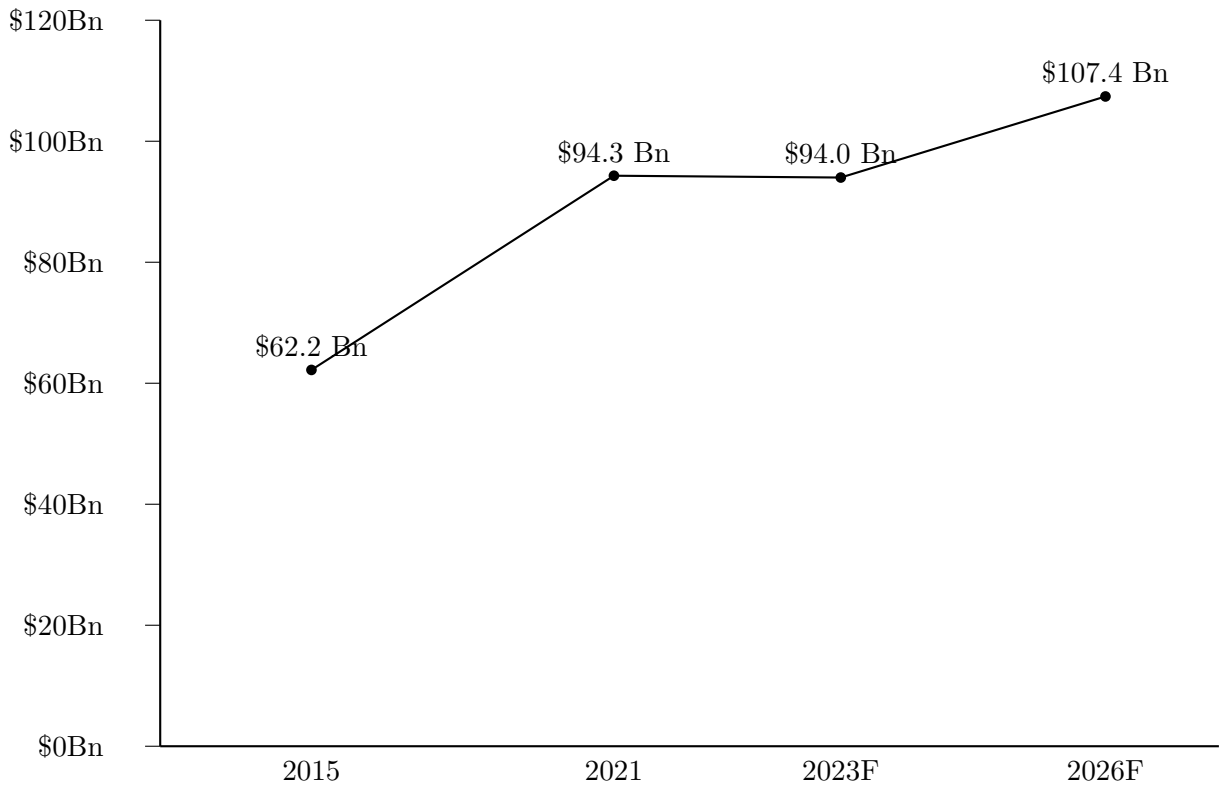
(a) Using the total percentage increase 9.3% over 3 years, estimate the number of console players in 2023F. [2]

(b) Calculate the CAGR (to 2 decimal places) corresponding to a total increase of 9.3% over 3 years. [2]

(c) Comment briefly on whether a CAGR of this size indicates rapid growth. [2]

Question 3 **[8 marks]**

Graph 1 (recreated)



(a) Using the graph, estimate the absolute change in revenue between 2021 and 2026F. [1]

(b) The Preliminary Material notes a small fall between 2021 and 2023F. Give one plausible explanation for a short-term fall in revenue in this market. [1]

(c) The graph shows different growth phases. Describe the overall trend from 2015 to 2026F and explain one implication for game developers. [3]

(d) The Preliminary Material indicates most growth will come from consoles. Suggest one reason why console revenue might grow faster than PC revenue. [1]

Question 4 [6 marks]

Graph 2 (recreated pie charts with clear labels)

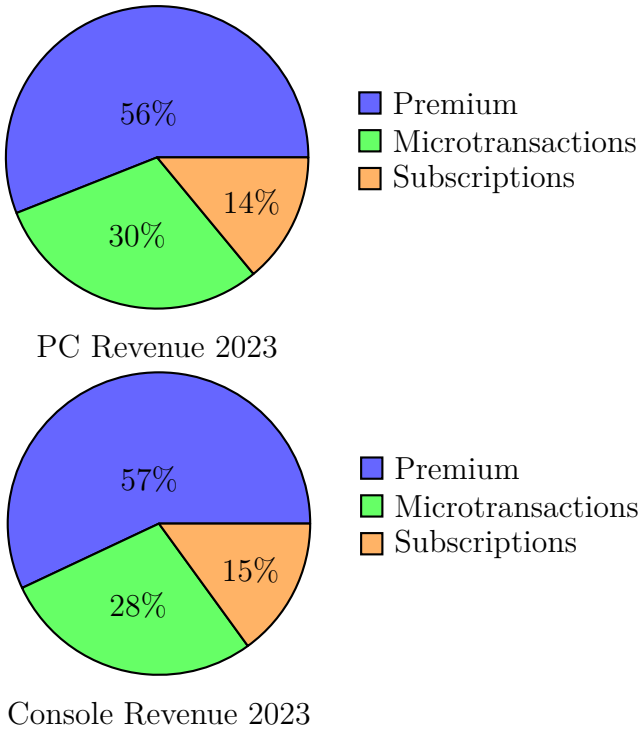


Figure 1: Graph 2: Revenue sources for PC and console in 2023 (recreated)

(a) Give one reason why premium purchases might form a larger share of console revenue than PC revenue. [1]

(b) If total PC revenue in 2023 was \$40 billion, calculate the revenue from microtransactions (30%). [2]

(c) Explain two reasons why developers value recurring revenue (microtransactions and subscriptions). [3]

Question 5 **[6 marks]**

Report B gives survey preferences in 2023: 53% prefer F2P, 39% prefer premium, 9% prefer subscription (PAYG not included).
A survey sampled 1500 players.

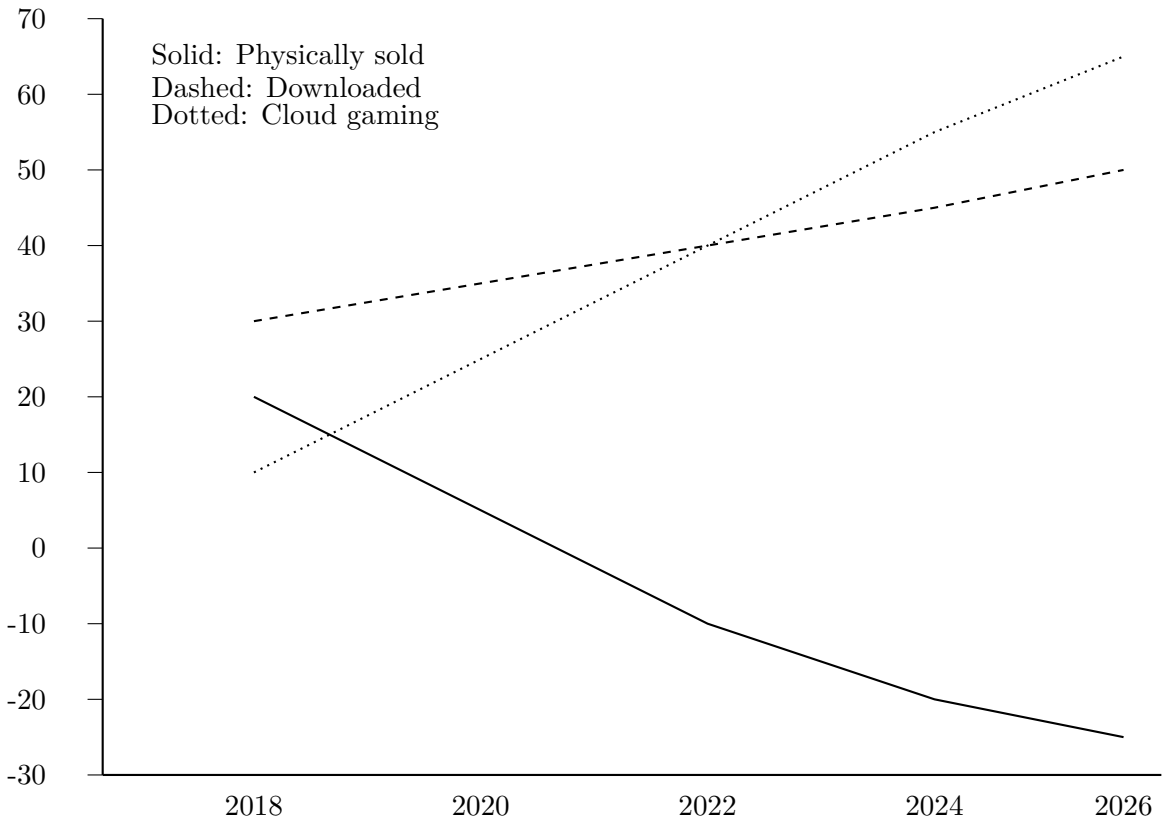
(a) Calculate the number of players who preferred F2P. [2]

(b) Calculate how many more players preferred premium than subscription. [2]

(c) Suggest one limitation of the survey results when generalising to the global player population. [2]

Question 6 **[8 marks]**

Graph 3 (recreated line trends)



(a) Which game type shows the highest growth by 2026? [1]

(b) Describe the trend for physically sold games between 2018 and 2026. [2]

(c) Compare the growth patterns of downloaded games and cloud gaming between 2018 and 2024. [2]

(d) Suggest one technological factor that could explain rapid growth in cloud gaming. [1]

Question 7 **[8 marks]**

PAYG games charge players by time. A PAYG title charges \$0.35 per hour.
A player uses the game for 14 hours in month 1, 22 hours in month 2 and 9 hours in month 3.

(a) Calculate the total PAYG cost for the three months. [2]

(b) A monthly subscription costs \$9.99. Determine which payment method is cheaper for this player over the three months and by how much. [3]

(c) Give one advantage of PAYG for players and one disadvantage for developers. [3]

Question 8 **[10 marks]**

A cloud gaming company had revenue of \$28 billion in 2018 and \$50 billion in 2023.

(a) Calculate the percentage increase in revenue from 2018 to 2023. [2]

(b) Calculate the CAGR over the 5-year period (2018 to 2023). Give your answer to 2 decimal places. [4]

(c) Using the CAGR found in part (b), estimate the revenue in 2026 (3 years after 2023). Give your answer to the nearest \$0.1 billion. [3]

(d) State one assumption you have made in part (c). [1]

Question 9 [9 marks]

JPMorgan analysts report sample estimates for **physical game sales (US$ billion)** in 2027F from independent market samples:
PC physical sales: $\bar{X}_{PC} = 48.2,\ s_{PC} = 6.5,\ nsample_{PC} = 64.$
Console physical sales: $\bar{X}_{C} = 31.4,\ s_{C} = 5.8,\ nsample_{C} = 64.$

Use the normal z-distribution and give numerical answers to one decimal place where appropriate.

(a) State the z-critical value used for a two-sided 95% confidence interval. [1]

(b) Calculate a 95% confidence interval for the mean 2027F physical sales for **PC**. Show all working. [3]

(c) Calculate a 95% confidence interval for the mean 2027F physical sales for **Console**. Show all working. [3]

(d) A later market bulletin reports a single observed value for PC physical sales in 2027F of \$**47.5** billion.

i. Check whether this observed value lies inside your 95% confidence interval from part (b). Show the comparison. [1]

ii. Briefly explain whether the fact that the observed value lies inside the interval means it is the "expected value" of PC sales. [1]

END OF PAPER