Math – Midterm (20 marks)

Student's Name: _____

Grade 11th

مدارس البكالوريا
BACCALAUREATE SCHOOLS

12th October, 2025

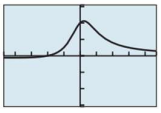
Q1) Find the Domain and Range of the following functions using interval notation:

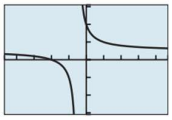
$$h(x) = \frac{\sqrt{4 - x^2}}{x - 3} \qquad f(x) = \frac{1}{x} + \frac{5}{x - 3}$$

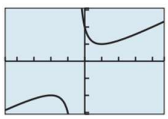
Q2) Find all the vertical and horizontal asymptotes if any:

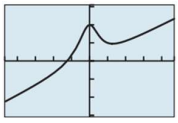
$$y = \frac{2x+16}{x+8} \qquad \frac{2x^2+6x}{x^2+5x+6}$$

Q3) match the function with the corresponding graph by considering end behavior and asymptotes. All graphs are shown in the same viewing window.

A. $y = \dfrac{x + 2}{2x + 1}$ **A.** 

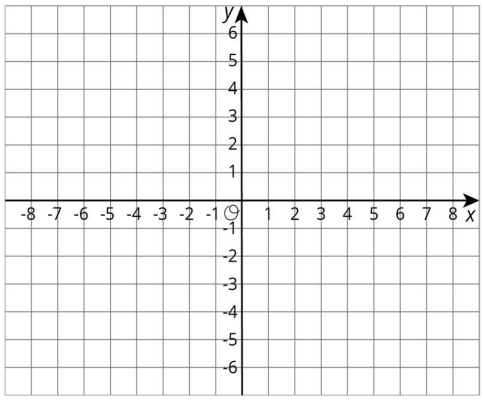
B. $y = \dfrac{x^2 + 2}{2x + 1}$ B. 

C. $y = \dfrac{x + 2}{2x^2 + 1}$ C. 

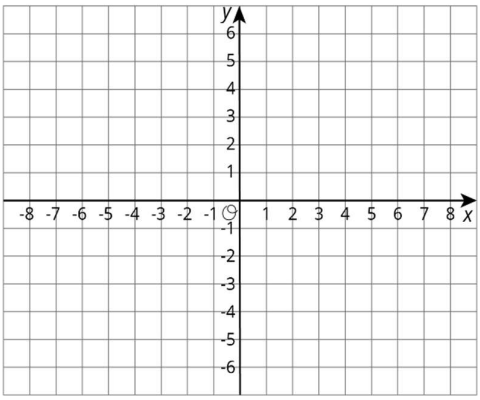
D. $y = \dfrac{x^3 + 2}{2x^2 + 1}$ D. 

Q4) Graph the following functions:

$$s(x) = |x - 2|$$



$$q(x) = e^x + 2$$



Q5) Find (f o g) (3) and (g o f) (-2) for the following:

$$f(x) = \frac{x}{x+1}; g(x) = 9 - x^2$$

Q6) find f(g(x)) and state its **domain** for the following:

$$f(x) = x^2 - 1; g(x) = \frac{1}{x-1}$$

Student's Name: _____

Grade 11th

مدارس البكالوريا
BACCALAUREATE SCHOOLS

12th October, 2025

Q7) Find the inverse of the following:

$$f(x)=\frac{x^2}{x^2+1} \qquad y=\frac{2x+1}{3-2x}$$

Q8) A high-altitude spherical weather balloon expands as it rises due to the drop in atmospheric pressure. Suppose that the radius *r* increases at the rate of 0.03 in./sec and that *r* = 48 in. at time *t* = 0. Determine an equation that models the volume *V* of the balloon at time *t* and find the volume when *t* = 300 sec.

Student's Name: _____

Grade 11th

مدارس البكالوريا
BACCALAUREATE SCHOOLS

12th October, 2025

Q9)

Currency Conversion In March of 2022 the exchange rate for converting U.S. dollars (x) to euros (y) was $y = 0.9x$.

(a) How many euros could you get for $250 U.S.?

(b) What is the inverse function, and what conversion does it represent?

(c) In the spring of 2022, a tourist from Seattle had an elegant lunch in Udine, Italy, ordering from a "fixed price" €36 menu. How much was that in U.S. dollars?