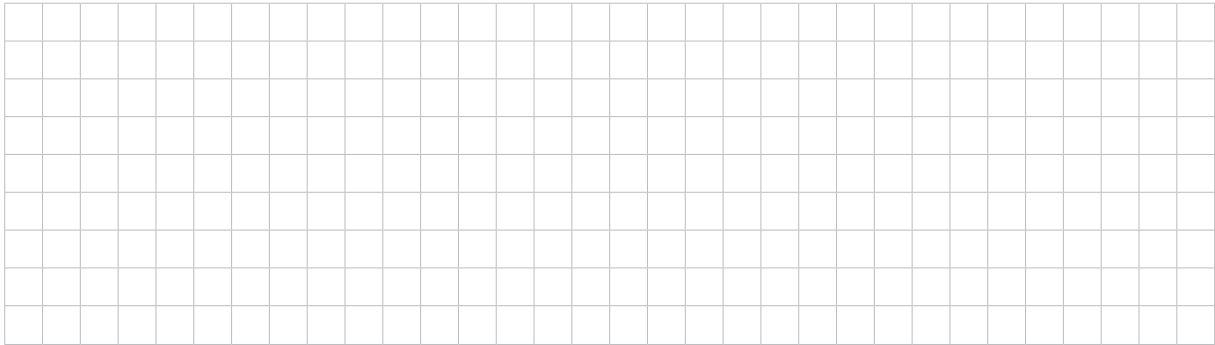


**Question 4** (10 marks)

Consider the function  $f(x) = \frac{x^3 - 2x + 5}{x^2 + 1}$ .

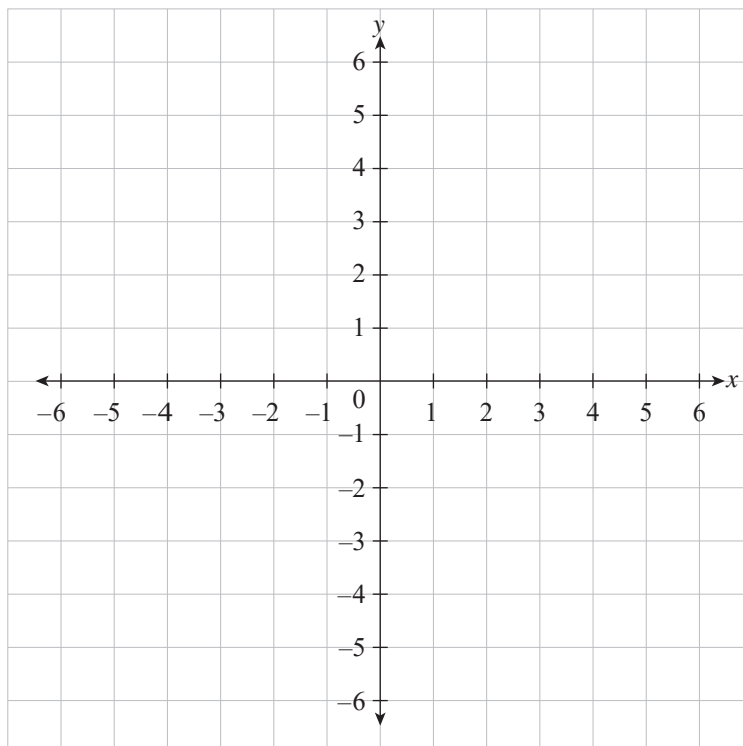
(a) Use a division process to show that  $f(x) = x - \frac{3x - 5}{x^2 + 1}$ .



(2 marks)

(b) On the axes in Figure 3, draw the function  $f(x) = x - \frac{3x - 5}{x^2 + 1}$ .

Clearly show the behaviour of the function near any asymptotes.



**Figure 3**

(3 marks)



(ii) Show that the **exact** volume of this solid is  $\frac{5\pi^2}{2}$ .



(3 marks)