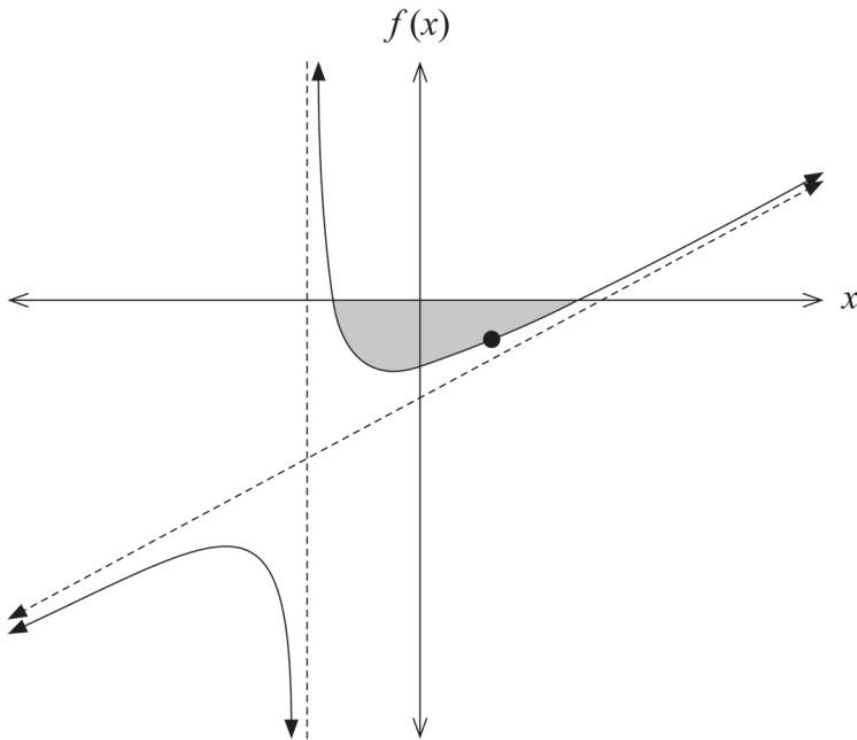


**Question 18**

**(6 marks)**

Function  $f(x)$  is a rational function of the form  $\frac{x^2 + bx + c}{x + d}$  with the following properties:

- $f(2) = -2$
- $f(x)$  has a vertical asymptote at  $x = -3$  and another asymptote with equation  $y = x - 5$ .



(a) Show that  $b = -2$ ,  $c = -10$  and  $d = 3$ .

**(3 marks)**

(b) Calculate the exact area of the shaded region.

(3 marks)