

QUESTION 8 (10 marks)

(a) Show that $\frac{1}{x-2} - \frac{1}{x+3} = \frac{5}{(x-2)(x+3)}$.

$$\frac{1}{x-2} - \frac{1}{x+3} = \frac{(x+3) - (x-2)}{(x-2)(x+3)}$$
$$= \frac{5}{(x-2)(x+3)}$$

(1 mark)

Let $f(x) = \frac{5}{(x-2)(x+3)}$.

(b) (i) Draw the graph of $y = f(x)$ on the axes in Figure 5.

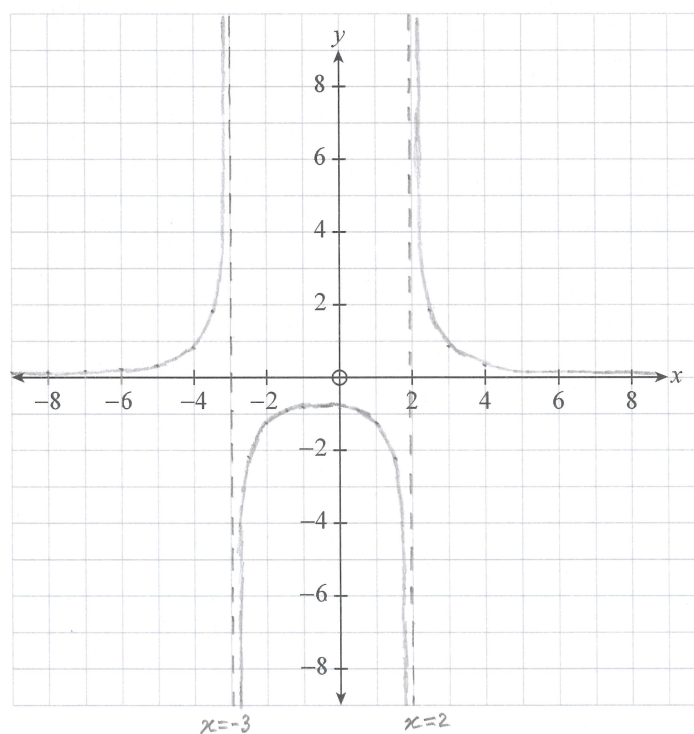


Figure 5

(3 marks)

(ii) Draw the graph of $y = |f(x)|$ on the axes in Figure 6.

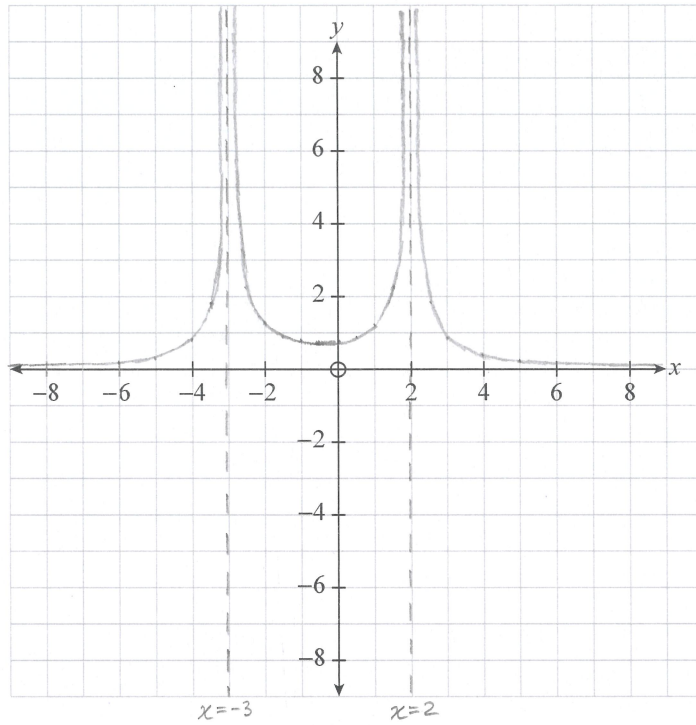


Figure 6

(1 mark)

(iii) Draw the graph of $y = |f(x)| - f(x)$ on the axes in Figure 7.

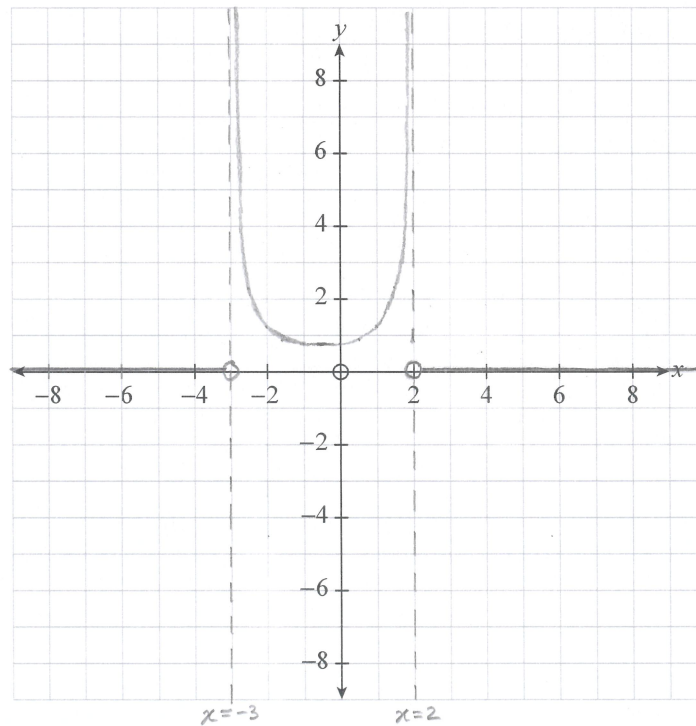
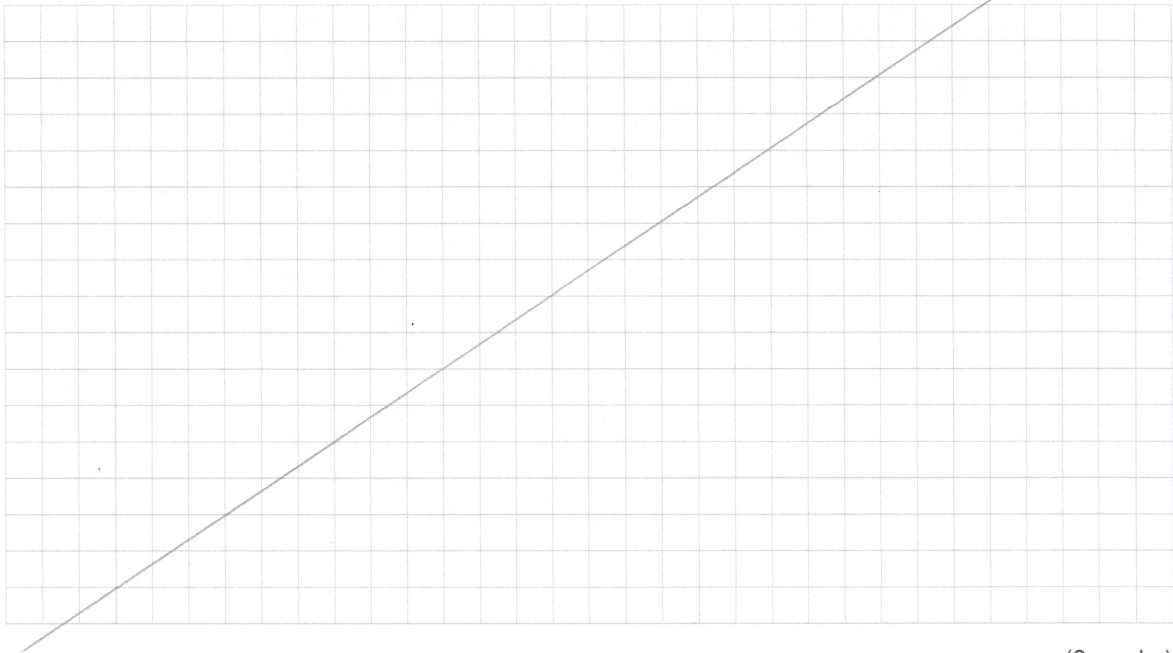


Figure 7

(2 marks)

- (c) Find the exact area between the graph of $y = |f(x)| - f(x)$, the x -axis, and the lines $x = -2$ and $x = 1$.



(3 marks)