

# ANSWERS KEY

## Quiz 8

Calculators are not allowed. Write your answers on the dashed lines.

[40] Question 1: Simplify these expressions.

[20] •  $\frac{4}{x-4} - \frac{4}{x+1} =$

-6/ error

$$\frac{4}{x-4} - \frac{4}{x+1} = \frac{4(x+1) - 4(x-4)}{(x-4)(x+1)} = \frac{4x+4-4x+16}{(x-4)(x+1)}$$

$$= \frac{20}{(x-4)(x+1)} = \frac{20}{x^2-3x-4} \quad \left. \vphantom{\frac{20}{(x-4)(x+1)}} \right\} \text{ both ok}$$

[20] •  $\frac{\frac{1}{a} + \frac{1}{b}}{\frac{1}{a} - \frac{1}{b}} =$

-6/ error

$$\frac{\frac{1}{a} + \frac{1}{b}}{\frac{1}{a} - \frac{1}{b}} = \frac{\frac{b+a}{ab}}{\frac{b-a}{ab}} = \frac{b+a}{ab} \cdot \frac{ab}{b-a} = \frac{b+a}{b-a}$$

Please turn page over.

[60] Question 2: Study the following rational function:  $f(x) = \frac{x}{(x+1)(x-3)}$

NP [5] • What is the y-intercept? 0

NP [5] • What is the x-intercepts? 0

NP [5][5] • Where are the vertical asymptotes: -1 and 3

~~NP~~ [10] • What is the behavior as  $x$  goes to  $\pm\infty$ ?

$$f(x) \approx \frac{x}{x^2} = \frac{1}{x} \rightarrow \text{as } x \rightarrow \pm\infty, f(x) \rightarrow 0$$

[5] [5]

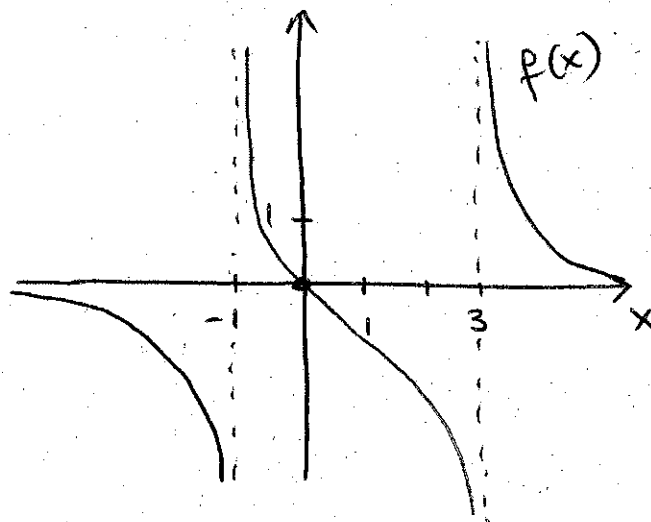
[15] • Draw a signs table, and do not forget the zeros and asymptotes

		-1	0	3	
x		-	- 0 +	+	+
x+1		-	∞ +	+	+
x-3		-	-	-	∞ +
		-	∞ + 0 -	∞ +	+

-4 / incorrect line/column.

-2 if 0/asymptote missing

[15] • Sketch the function on this graph, make sure to indicate all of the information above (intercepts, asymptotes; etc.).



-4 if asymptotes missing

-4 if intercept missing

-4 / inconsistency with above.