QUESTION 5

Given: $f(x) = \dfrac{4}{x-3} + 2$ and $g(x) = x + 2$

5.1 Write down the equations of the asymptotes of f. (2)

5.2 Determine the x-intercept of f. (3)

5.3 Determine the y-intercept of f. (2)

5.4 Sketch the graphs of f and g on the same system of axes. Show clearly ALL the intercepts with the axes and any asymptotes. (5)

5.5 Calculate the x-coordinates of the points of intersection of f and g. (4)

5.6 If $x < 3$, determine the values of x for which $\dfrac{4}{x-3} + 2 < x + 2$. (2)

5.7 The line $y = x - 1$ cuts f at P(1 ; 0) and Q. Write down the coordinates of Q. (3)

[21]

Answer

QUESTION/VRAAG 5

5.1	$x = 3$ $y = 2$	$\checkmark x = 3$ $\checkmark y = 2$ (2)
5.2	$0 = \dfrac{4}{x-3} + 2$ $-2 = \dfrac{4}{x-3}$ $-2(x-3) = 4$ $-2x + 6 = 4$ $x = 1$	$\checkmark$ subst./*verv.* $y = 0$ $\checkmark$ simplification/*vereenv.* $\checkmark$ answer/*antw.* (3)

5.3		
	$y = \dfrac{4}{0-3} + 2$ $= \dfrac{2}{3}$	✓ subst/*verv.* $x = 0$ ✓ answer/*antw.* (2)

5.4		
		For/*Vir f* ✓ asymptotes/*asimptote* ✓ shape/*vorm* ✓ x- and y- int. /*afsnit* For/*Vir g* ✓ x-int./*afsnit* ✓ y-int./*afsnit* (5)

5.5		
	$\dfrac{4}{x-3} + 2 = x + 2$ $\dfrac{4}{x-3} = x + 2 - 2$ $\dfrac{4}{x-3} = x$ $x(x-3) = 4$ $x^2 - 3x - 4 = 0$ $(x-4)(x+1) = 0$ $x = 4$ or $x = -1$	✓ $\dfrac{4}{x-3} + 2 = x + 2$ ✓ std vorm/*stand. vorm* ✓ factors/*faktore* ✓ answers/*antw.* (4)
5.6	$-1 < x < 3$	✓✓ answer/*antwoord* (2)

$x - 1 = \dfrac{4}{x-3} + 2$ $x - 3 = \dfrac{4}{x-3}$ $(x-3)^2 = 4$ $x^2 - 6x + 5 = 0$ $(x-5)(x-1) = 0$ $x = 5$ or $x = 1$ $y = 5 - 1 = 4$ $Q(5;4)$	✓ equating / *vergelyk* ✓ 5 ✓ 4 (3) **[21]**	