Taak: rationale functies

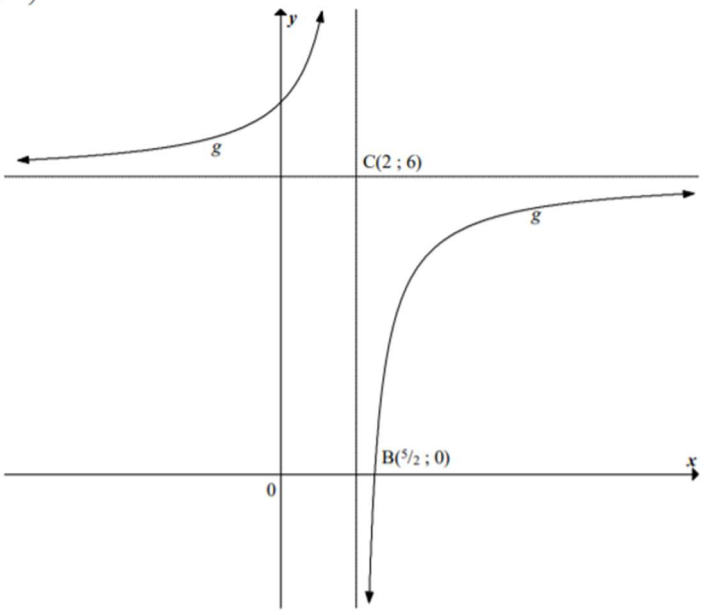
Virga Jessecollege **Toets WISKUNDE**

Hasselt **leerkracht: Karel Appeltans**

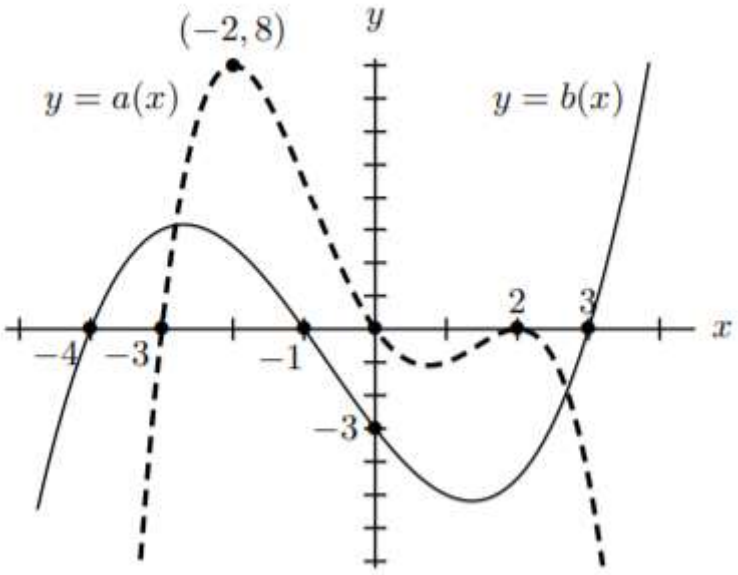
Datum: **schooljaar**

Klas: V **Studierichting:**

Naam:..... **Aantal uren wiskunde: 6**

1	Bepaal domein, nulpunten en tekentabel en eventuele asymptoten/perforaties van: $y = \frac{(x-3)^2(x+2)}{(2x-4)(2-3x)}$
2	Résoudre l'inéquation suivante, pour $x \in \mathbb{R}$: $\frac{x^3+32x+18}{x^2+4x+3} \geq 6.$
3	Bepaal domein, nulpunten en tekentabel en eventuele asymptoten/perforaties van: $\frac{5x^2+26x+21}{x^2+5x+4}$.
4	Sketched below is the graph of $g(x) = \frac{a}{x-p} + q$. C(2 ; 6) is the point of intersection of the asymptotes of g. B$\left(\frac{5}{2}; 0\right)$ is the x-intercept of g.  1. a. Bepaal de waarden van de parameters a,p en q b. Bepaal de transformaties die men moet uitvoeren op de grafiek van $f(x) = \frac{1}{x}$ om bovenstaande grafiek te bekomen

5	Een container moet een volume van $10m^2$ hebben en met een lengte die tweemaal de breedte is. De kostprijs voor de bodem bedraagt $10\frac{euro}{m^2}$ en voor de andere wanden $6\frac{euro}{m^2}$. Bepaal de afmetingen met minimale kostprijs. Het is een open container en je moet niet de afmetingen voor de minimale kostprijs, wel deze voor een kostprijs van 200 euro bepalen
6	(b) Let $r(x)=\dfrac{3(x^2-x-2)}{x^2-9}$. Find the following. i. The y-intercept, if any and write your answer as a point. ii. The x-intercept(s), if any and write your answers as points. iii. The vertical asymptotes, if any and write your answers as equations of lines. iv. The horizontal asymptote, if any and write your answer as an equation of a line.
7	**2A)** Considera la siguiente función presentada a continuación, $$f(x)=\frac{x^2+ax+1}{x+a^2}$$ donde $a\in\mathbb{R}$. Responde a las siguientes cuestiones: a) [1 punto] Calcula los valores de a para los que $f(x)$ tiene como asíntota oblicua a la recta: $y=x-6$. (Bepaal de waarde(n) van a zodat de grafiek van f een SA heeft met als vgl: y=x-6)
8	Bepaal de transformaties uitgevoerd op de grafiek van $y=\frac{1}{x}$ om de grafiek van $y=\frac{-2x+4}{x+1}$ te bekomen. Schets ook stap voor stap de grafiek
9	Résoudre dans $\mathbb{R}$ $$\frac{x+3}{x+2}-\frac{x+2}{3x+9}\geq\frac{x^2-3}{x^2+5x+6}.$$
10	**3. Let $R(x)=\frac{(3x+15)(6-x)}{(x-2)^2}$.** **a. Use a table of signs to solve the inequality $R(x)\leq 0$. Write your solution in interval form.** **b. Find each of the following for $R(x)$ and its graph. Do <u>not graph</u> $R(x)$.** **(i) x-intercept(s) (coordinate pair(s));** **(ii) y-intercept (coordinate pair);** **(iii) Vertical asymptote(s) (equation of a line)** **(iv) Horizontal asymptote (equation of a line)**
11	Bepaal domein, nulpunten en tekentabel en eventuele asymptoten/perforaties van: $$f(x)=\frac{x^3+2x^2+x}{x^2-x-2}$$
12	Bepaal domein, nulpunten en tekentabel en eventuele asymptoten/perforaties van: $$f(x)=\frac{-5x^4-3x^3+x^2-10}{x^3-3x^2+3x-1}$$

13	Bepaal de parabool p(x) Determinare l'espressione del polinomio $p(x)$ tale che il grafico della funzione $f(x)=\frac{p(x)}{2x+1}$ passi per il punto $P(1,0)$ ed abbia per asintoto obliquo la retta di equazione $y=3x-2$.
14	Bepaal domein, nulpunten en tekentabel en eventuele asymptoten/perforaties van: $f(x)=\frac{x^3-6x^2+8x}{-3x^2+9x-6}$
15	... the steps to sketch ... of $R(x)=\frac{(2x+7)(x-3)^2}{(x+2)^3}$. a) Determine the $x-$intercepts and $y-$intercept of the graph. b) Determine the vertical asymptotes of the graph. c) Determine the horizontal/oblique asymptotes of the graph.
16	 Bepaal nulpunten en eventuele asymptoten van $\frac{b(x)}{a(x)}$
17	2. Consider the function $R(x)=\frac{(18-3x)(x+5)}{(x-2)^2}$. (15 pts) a. Use a table of signs to solve the inequality $R(x)\leq 0$. Write your solution in interval form. (10 pts) b. For $R(x)$ and its graph find the following. If an item does not exist, write DNE. Do not graph. (i) x-intercept(s) (coordinate pair(s)); (ii) y-intercept (coordinate pair); (iii) Vertical asymptote(s); (iv) Horizontal asymptote.
18	Let $R(x)=\frac{(x+2)^2}{(4+x)(4-2x)}$. (14 pts) a. Use a table of signs to solve the inequality $R(x)\geq 0$. Write your answer in interval form. (10 pts) b. Find each of the following for $R(x)$ and its graph. Do not graph $R(x)$. (i) x-intercept(s) (coordinate pair(s)); (ii) y-intercept (coordinate pair); (iii) Vertical asymptote(s) (equation of a line) (iv) Horizontal asymptote (equation of a line)

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In un sistema di assi cartesiani ortogonali Oxy una curva γ ha per equazione

$$y = \frac{3(x-1)^2}{ax^2+bx+c}.$$

a) Si calcolino i valori delle costanti reali a, b, c, sapendo che γ ha per asintoti le rette di equazioni $y = 3$ e $x = -2$, e passa per il punto $(3, 12/5)$.

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5. Let $R(x) = \frac{(3x+15)(2-x)}{(x-5)^2}$.

(15) a. Use a table of signs to solve the inequality $R(x) \leq 0$. Write your solution in interval form.

(10) b. Find each of the following for R and its graph. If an item does not exist, write DNE. Do not graph the function.

(i) x-intercept(s) ii. y-intercept iii. Vertical asymptote(s) iv. Horizontal asymptote

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3. Let $R(x) = \frac{(2x+4)(3-x)}{(x+1)^2}$.

(15) a. Use a table of signs to solve the inequality $R(x) \leq 0$. Write your solution in interval form.

(10) b. Find each of the following for R and its graph. If an item does not exist, write DNE.

(i) x-intercept(s) ii. y-intercept iii. Vertical asymptote(s) iv. Horizontal asymptote

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1. Let $R(x) = \frac{(2x+4)^2}{(2-x)(x+4)}$ ε

(15) a. Use a table of signs to solve the inequality $R(x) \geq 0$. Write your answer in interval form.

(10) b. Find the following for R and its graph. If any of these does not exist, write DNE.
(i) x-intercept(s); (ii) y-intercept; (iii) vertical asymptote(s); (iv) horizontal asymptote.

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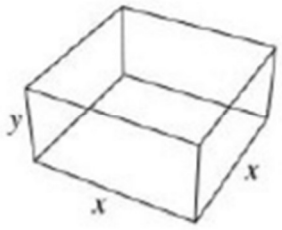
. Een firma van verpakkingsmateriaal heeft volgende doos in haar assortiment: een open opbergdoos met een inhoud van $\frac{9}{4}m^3$ en met een vierkante bodem. Als de kostprijs voor de bodem 4 euro per m^2 kost en de kostprijs voor de zijwanden 3 euro per m^2 kosten, toon dan



aan dat de $C(x) = 4x^2 + \frac{27}{x}$ bedraagt.

Bepaal de afmetingen zodat de kostprijs 45 euro is.

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Let $r(x) = \frac{(3x-6)^2(x+2)}{3(x+1)(x-1)^2}$. Find the following.

i. The y-intercept, if any and write your answer as a point.
ii. The x-intercept(s), if any and write your answers as points.
iii. The vertical asymptotes, if any and write your answers as equations of lines.
iv. The horizontal asymptote, if any and write your answer as an equation of a line.

25	a. Let $R(t)=\frac{(4-t)(t+1)}{(t^2+4)(t-3)}$. Find the following for R and its graph: (i) domain; (ii) coordinates of the t-intercept(s); (iii) coordinates of the y-intercept; (iv) vertical asymptote(s); (v) horizontal asymptote(s). You don't need to draw the graph.
26	Let $f(x)=\frac{x^2+x-6}{25-x^2}$, $g(x)=\frac{x^4+26}{x^2+9}$, $h(x)=\frac{3x^2-27}{x-3}$, $k(x)=\frac{2x-1}{x^2-x-2}$. These are the functions referred to in parts a-c. There may be more than one answer to parts a and b. If there is no answer in part a or part b, write NONE a. Which of these rational functions has a horizontal asymptote? b. Which of these rational functions doea **not** have a vertical asymptote?
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