① a) $\left(2^{2/3}\right)^{1/8} = 2^{2/24} = 2^{1/12} = \sqrt[12]{a}$

b) $a^{-x} \cdot a^{-x} = (a^{-x})^2 = a^{-2x} = \dfrac{1}{a^{2x}}$

② a) $(f - 2g)(1) = f(1) - 2g(1)$

$= \sqrt{2\cdot1+5} - 2\cdot\left(\dfrac{-5}{2\cdot1+3}\right)$

$= \sqrt{7} + 2\cdot\dfrac{5}{5} = 2 + \sqrt{7}$

b) $(f \circ g)(x) = f\left(-\dfrac{5}{2x+3}\right) = \sqrt{2\cdot\left(\dfrac{-5}{2x+3}\right)+3}$

$= \sqrt{\dfrac{-10}{2x+3} + 3\cdot\dfrac{2x+3}{2x+3}} = \sqrt{\dfrac{6x-1}{2x+3}}$

③ $\sqrt{3x+5} = \sqrt{2-x}$

$\Rightarrow \left(\sqrt{3x+5}\right)^2 = \left(\sqrt{2-x}\right)^2$

$3x+5 = 2-x$

$4x = -3$

$x = -\dfrac{3}{4}$

BV: $3x+5 \geq 0 \Leftrightarrow x \geq -\dfrac{5}{3}$

$2-x \geq 0 \Leftrightarrow -x \geq -2$

$\Leftrightarrow x \leq 2$

KV: OK

$V = \left\{-\dfrac{3}{4}\right\}$

④ * dom $2x^2 - 9x - 35 \geq 0$ $D = 81 - 4\cdot2\cdot(-35) = 361 = 19^2$

$x_1 = \dfrac{9-19}{4} = -2{,}5$ $x_2 = \dfrac{9+19}{4} = \dfrac{28}{4} = 7$

x		$-2{,}5$		7	
$2x^2-9x-35$	+	0	−	0	+

dom $f = \left]-\infty; -2{,}5\right] \cup \left[7, +\infty\right[$

* nulw: $\sqrt{2x^2-9x-35} = \sqrt{10}$ BV: zie dom KV: OK

$2x^2 - 9x - 35 = 10$

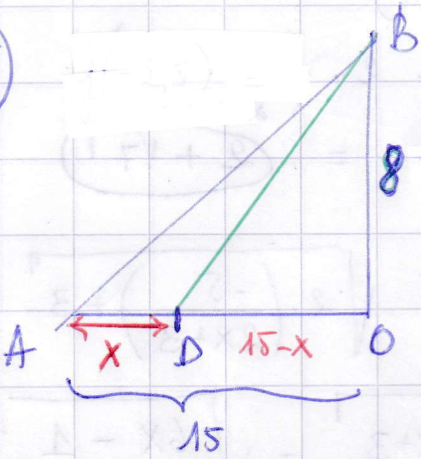
$2x^2 - 9x - 45 = 0$ $D = 441$ $x_1 = -3$ $x_2 = \dfrac{15}{2}$

$\Rightarrow$ f heeft nulw -3 en $15/2$

* Tekentabel

x		-3		$-2,5$		7		$7,5$	
$f(x)$	$+$	0	$-$	$-\sqrt{10}$	/	$-\sqrt{10}$	$-$	0	$+$

(5)



$|AO| = 15\,km$

$|OB| = 8\,km$

$|DB| = \sqrt{(15-x)^2 + 8^2}$

$|AD| = x$

$$t(x) = \frac{x}{5} + \frac{\sqrt{(15-x)^2+64}}{3}$$

(6) f continu in -3

In de omgeving van $x=-3$ kunnen we de grafiek in 1 pennentrek tekenen

dus $2(-3) + c = 1 - (-3)^2$

$-6 + c = 1 - 9$

$c = -8 + 6$

$c = -2$

(7) $\lim\limits_{x \to -\infty} f(x) = 2$ $\quad \lim\limits_{\substack{x \to 0 \\ <}} f(x) = -\infty$ $\quad \lim\limits_{\substack{x \to 0 \\ >}} f(x) = +\infty$

$\lim\limits_{x \to 2} f(x) = 2$ $\quad \lim\limits_{\substack{x \to 4 \\ <}} f(x) = 4$ $\quad \lim\limits_{\substack{x \to 4 \\ >}} f(x) = 1$

$\lim\limits_{x \to 6} f(x) = 3,5$ $\quad \lim\limits_{x \to +\infty} f(x) = -\infty$

(8) * $\lim\limits_{x \to -2} \dfrac{x^2+2x-8}{x^4-16} = \dfrac{4-4-8}{16-16} = \dfrac{-8}{0}$

$x^4 = 16 \Leftrightarrow x = 2 \vee x = -2$

x		-2		2	
x^4-16	$+$	0	$-$	0	$+$

$\Rightarrow \lim\limits_{\substack{x \to -2 \\ <}} \dfrac{x^2+2x-8}{x^2-16} = -\infty$

$\lim\limits_{\substack{x \to -2 \\ >}} \dfrac{x^2+2x-8}{x^2-16} = +\infty$

* $\lim\limits_{x \to 2} \dfrac{x^2+2x-8}{x^4-16} = \dfrac{4+4-8}{16-16} = \dfrac{0}{0}$

T:

	1	2	-8
2		2	8
	1	4	0

$= \lim\limits_{x \to 2} \dfrac{\cancel{(x-2)}(x+4)}{(x^2+4)\cancel{(x-2)}(x+2)}$

$= \dfrac{\cancel{6}^{\,3}}{8 \cdot \cancel{4}\,2} = \dfrac{3}{16}$

(9) $Df(x) = 6x+4$ $\qquad Df(1) = 6+4 = 10$

(10) $D \sin\left(\dfrac{x+2}{x^2}\right) = \cos\left(\dfrac{x+2}{x^2}\right) D\left(\dfrac{x+2}{x^2}\right)$

$= \cos\left(\dfrac{x+2}{x^2}\right) \cdot \dfrac{x^{\cancel{2}} \cdot 1 - (x+2) \cdot 2\cancel{x}}{x^{\cancel{4}\,3}}$

$= \cos\left(\dfrac{x+2}{x^2}\right) \cdot \dfrac{x-2x-4}{x^3}$

$= \cos\left(\dfrac{x+2}{x^2}\right) \cdot \dfrac{-x-4}{x^3} = -\dfrac{x+4}{x^3} \cdot \cos\left(\dfrac{x+2}{x^2}\right)$

11 $\begin{pmatrix} b & 2a+6 \\ 0 & -4 \end{pmatrix} - \begin{pmatrix} 5b & 4 \\ 0 & -6 \end{pmatrix} = \begin{pmatrix} 2 & 0 \\ 0 & 2 \end{pmatrix}$

$\begin{pmatrix} -4b & 2a+2 \\ 0 & 2 \end{pmatrix} = \begin{pmatrix} 2 & 0 \\ 0 & 2 \end{pmatrix}$

$\begin{cases} -4b = 2 \\ 2a+2 = 0 \end{cases} \Leftrightarrow \begin{cases} b = -\frac{1}{2} \\ a = -1 \end{cases}$