

تمرین 03

- (C_f) $f(x) = \sqrt{x^2 - x + 1}$: f
- . (O, \vec{i}, \vec{j})
- . $\frac{\sqrt{3}}{2}$ f $D_f = \mathbb{R}$ - (1)
- $\forall x \in \left[\frac{1}{2}, +\infty\right[: x - \frac{1}{2} < f(x) \leq x - \frac{1}{2} + \frac{1}{2x}$: - (2)
- : (Δ₁) $\left[\frac{1}{2}, +\infty\right[$ f
- . (D₂): $y = x + \frac{1}{2}$ (D₁): $y = x - \frac{1}{2}$
- f $\forall x \in \mathbb{R} : f(1-x) = f(x)$: - (3)
- : (Δ₂) $\left]-\infty, \frac{1}{2}\right]$
- . (D₂'): $y = -x + \frac{3}{2}$ (D₁'): $y = -x + \frac{1}{2}$

تمرین 04

- : \mathbb{R} h g f
- $h(x) = |f(x)|$ $g(x) = f(|x|)$ $f(x) = (1+x)(2-x)$
- . (O, \vec{i}, \vec{j}) (C_f) - (1)
- . (C_f) (O, \vec{i}, \vec{j}) (C_g) g - (2)
- . (C_f) (O, \vec{i}, \vec{j}) (C_h) $h(x)$ - (3)
- : (O, \vec{i}, \vec{j}) (C_f) - (4)
- $f_3 : x \mapsto -f(-x)$ $f_2 : x \mapsto f(-x)$ $f_1 : x \mapsto -f(x)$
- . $f_5 : x \mapsto |f(-x)|$ $f_4 : x \mapsto f(-|x|)$

تمرین 01

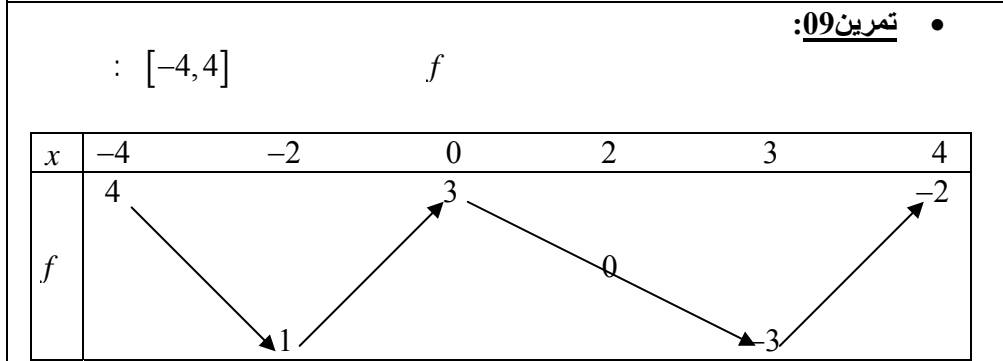
- : g f
- $g(x) = 3 - 2x - x^2$ $f(x) = \frac{1-x}{1+x}$
- . (O, \vec{i}, \vec{j}) (C_g) (C_f)
- . (C_g) (C_f) - (1)
- \mathbb{R} (C_g) (C_f) (O, \vec{i}, \vec{j}) - (2)
- . (I): $\frac{x^3 + 3x^2}{x+1} \geq 2$:
- : k h - (3)
- . $k(x) = \frac{2}{1-|x|}$ $h(x) = \frac{x}{|x|-2}$
- $\forall x \in D_h \cap \mathbb{R}_- : h(x) = f(x+1)$: h أ
- . (C_f) (O, \vec{i}, \vec{j}) (C_h)
- $\forall x \in D_k \cap \mathbb{R}_- : k(x) = 1 + f(x)$: k ب
- . (C_f) (O, \vec{i}, \vec{j}) (C_k)

تمرین 02

- : g f
- . $g(x) = \sqrt{\frac{x}{x^3 + x - 2}}$ $f(x) = x^2 - \frac{2}{x} + 1$
- . $\forall x \in D_g - \{0\} : \left(\frac{1}{g(x)}\right)^2 = f(x)$: D_g D_f - (1)
- $[-1, 0[$ $]0, +\infty[$ f - (2)
- . $]-\infty, -1]$
- . g - (3)

$\forall x \in \mathbb{R}_- : h(x) = f(-x) : h$ - (3)
 $(C_f) \quad (O, \vec{i}, \vec{j}) \quad (C_h) \quad (C_g)$ - (4)
 $h \circ f \quad g \circ f \quad f \circ f$ - (5)

تمرين 08 •
 $h(x) = \left(1 + \frac{1}{x}\right) \left(1 + \frac{1}{1-x}\right) \quad g(x) = 1 + \frac{2}{x}$
 $h = g \circ f$: - (1)
 h : - (2)
 $]0, 1[\quad 9 \quad h$ - (3)
 $]-\infty, 0[\cup]1, +\infty[$



(1) : $g(x) = -f(x) + 1$: g
 (4) : $g(x) = \frac{1-f(x)}{3+f(x)}$ (3) : $g(x) = \frac{1}{f(x)}$ (2) : $g(x) = [f(x)]^2$
 (7) : $g(x) = f(3-x)$ (6) : $g(x) = f(x^2)$ (5) : $g(x) = f\left(\frac{1}{x}\right)$

تمرين 05 •
 $f(x) = \frac{2x+3}{x^2+4} : \mathbb{R} \quad f$
 $x \neq y \quad \mathbb{R} \quad y \quad x \quad y \quad x \quad f \quad t(x, y)$ - (1)
 $t(x, y) = \frac{(x+4)(1-y) + (y+4)(1-x)}{(x^2+4)(y^2+4)} :$
 $[1, +\infty[\quad [-4, 1] \quad]-\infty, -4] : f$
 $-\frac{1}{4} \quad 1 \quad f$ - (2)
 $g(x) = \frac{2x+1}{x-2} : g$ - (3)
 $\forall x \in \mathbb{R} : -3 \leq g \circ f(x) \leq -\frac{2}{5} : D_{g \circ f} = \mathbb{R}$
 $g \circ f \quad]2, +\infty[\quad]-\infty, 2[\quad g$ - (4)

تمرين 06 •
 $g(x) = \frac{1+2x^2}{1+x} \quad f(x) = \frac{1-x}{1-2x^2}$
 $(C_g) \quad (C_f) \quad g \quad f \quad D = D_f \cap D_g$ - (1)
 $B = \frac{999000}{999998} \quad A = \frac{1000002}{1001000} : B \quad A$ - (2)

تمرين 07 •
 $h(x) = x(2-|x|) \quad g(x) = |x|(2-|x|) \quad f(x) = -x(x+2)$
 $(O, \vec{i}, \vec{j}) \quad (C_f)$ - (1)
 $\forall x \in \mathbb{R}_- : g(x) = f(x) : g$ - (2)

• **تمرین 10:**

f : (O, \vec{i}, \vec{j})

(1): $f(x) = E\left(\frac{1}{2}x + 1\right)$

(4): $f(x) = (-1)^{E(x)}$ (3): $f(x) = E(x^2)$ (2): $f(x) = E(2x - 1)$

• **تمرین 11:**

• $f(x) = x - E(x)$: \mathbb{R} f $T = 1$ f **-(1)**

• (O, \vec{i}, \vec{j}) $[-1, 2[$ f **-(2)**

: \mathbb{R} **-(3)**

• $n \in \mathbb{N}^*$ (2): $f(x) = 1 - \frac{x}{n}$ (1): $f(x) = 1 - \frac{x}{5}$

• **تمرین 12:**

• $f(x) = E\left(x - 2E\left(\frac{x}{2}\right)\right)$: \mathbb{R} f $T = 2$ f **-(1)**

$[-2, 4[$ $[0, 2[$ f **-(2)**

• (O, \vec{i}, \vec{j})

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