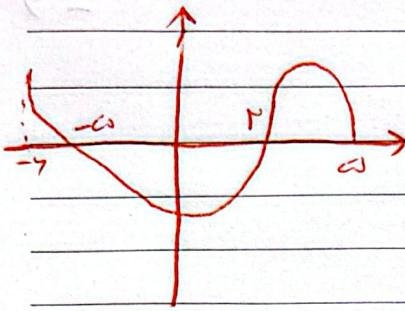
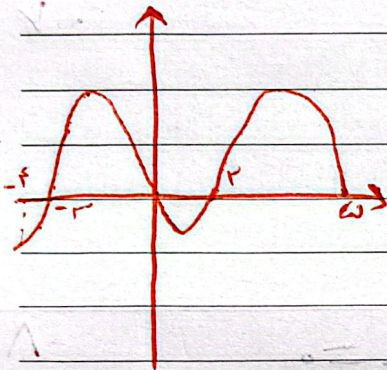




$$x f(x) \geq 0 \Rightarrow \begin{cases} x > 0, f(x) \geq 0 \\ x < 0, f(x) \leq 0 \end{cases} \Rightarrow D_f = [-4, 0] \cup [2, 4]$$

-2



$$\frac{-x}{f(x)} \geq 0 \Rightarrow f(x) \neq 0 \Rightarrow x \neq -4, -2, 0, 2, 4$$

$$\frac{-x}{f(x)} \geq 0 \Rightarrow \begin{cases} x \leq 0, f(x) \geq 0 \\ x > 0, f(x) \leq 0 \end{cases} \Rightarrow D_f = [-4, -2] \cup (0, 2]$$

$$f(x) - 2f(2) = x^2 - 2x + 1 \quad f(-2) = ?$$

$$x = 2$$

$$-f(2) = 4 - 4 + 1 = 1 \Rightarrow f(-2) - 2f(2) = 4 - 4 + 1 = 1 \Rightarrow f(-2) = 1$$

$$\left. \begin{aligned} f(1) &= 4, f(4) = 4 - \sqrt{9} = 1 \\ f(4) &= 1, f(1) = 4 \end{aligned} \right\} \Rightarrow f(f(4)) + f(f(1)) = 9$$

$$f(x) = ax^2 - bx + r \quad f(x-1) = a(x-1)^2 - b(x-1) + r$$

$$f(x-1) = ax^2 - 2ax + a - bx + b + r$$

$$f(x-1) - f(x) = ax^2 - 2ax + a - bx + b + r - ax^2 + bx - r = -2ax + a + b$$

$$= 4x + 2 \Rightarrow \begin{cases} -2a = 4 \Rightarrow a = -2 \\ a + b = 2 \Rightarrow b = 4 \end{cases} \Rightarrow a - b = -6$$

Subject:

$$f(x) = x^r - rx + 1 \quad f(1) = 1$$

$$\frac{rf(r) + f(-1)}{f'(r)} = \frac{r + 1}{1} = r + 1$$

$$f(-1) = 1 \quad f(r) = -1$$

$$\frac{rf(r) - rf(-r)}{f(r)} = \frac{r - 1}{1} = r - 1$$

$$f(-r) = r, \quad f(r) = -1$$

$$\frac{f(f(r)) - f(f(r))}{f(1) - r} = \frac{f(1) - f(r)}{f(1) - r} = \frac{1 - (-1)}{1 - r} = \frac{2}{1 - r}$$

$$f(r) = 1, \quad f(r) = r$$

$$f(x) = \frac{x^r + rx + 1}{(x+r)^r + 1} \quad f(\sqrt{r} - r) = \frac{r + 1}{r + 1} = 1$$

$$f(\sqrt{r} - r) = \frac{r + 1}{r + 1} = 1$$

$$f(r) = \frac{r + 1}{r + 1} = 1$$

$$f(x) = x^r + \frac{1}{x^r} - (f(\sqrt{x}))^r - f(x) = ?$$

$$(f(x))^r = x^r + \frac{1}{x^r} + r \Rightarrow (f(\sqrt{x}))^r = x^r + \frac{1}{x^r} + r$$

$$(f(\sqrt{x}))^r - f(x) = x^r + \frac{1}{x^r} + r - x^r - \frac{1}{x^r} = r$$

IDEA