

UNIVERSIDADE FEDERAL DE OURO PRETO
 INSTITUTO DE CIÊNCIAS EXATAS E BIOLÓGICAS
 DEPARTAMENTO DE MATEMÁTICA

Algumas respostas da Terceira lista de Exercícios

1) .

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|----------------------------------|----------------------------------|------------------------------------|
| a) $I=(-3, -2)$ $r=1/2$ | b) $I = [-3, -1]$ $r = 1$ | c) $I=(0, 2e)$ $r=e$ |
| d) $I = [0, 2]$ $r = 1$ | e) $I=[-7/2, -3/2)$ $r=1$ | f) $I = (1, 3]$ $r = 1$ |
| g) ? | h) $I=(-1, 1)$ $r=1$ | i) $I=[-1, 1]$ $r=1$ |
| j) $I=[-1, 1)$ $r=1$ | k) $I=(-1/2, 1/2)$ $r=1/2$ | l) $I = (-\infty, 0)$ $r = \infty$ |
| m) $I=(0, 1)$ $r=1/2$ | n) $I=(-1, 1)$ $r=1$ | o) $I = (-3, -1]$ $r = 2$ |
| p) $I = (-1, 1)$ $r = 1$ | q) $I = (-1, 1)$ $r = 1$ | r) $I = \mathbb{R}$ $r = \infty$ |
| s) $I = \mathbb{R}$ $r = \infty$ | t) $I = \mathbb{R}$ $r = \infty$ | u) $I = [-1, 1]$ $r = 1$ |
| v) $I = \mathbb{R}$ $r = \infty$ | x) $I = \mathbb{R}$ $r = \infty$ | z) $I = [-5, -1)$ $r = 2$. |

2) .

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|------------------------|------------------------|--------------------------|------------------------|------------------------|
| a) $\frac{e^x - 1}{x}$ | b) $\frac{1}{(1+x)^2}$ | c) $\frac{x}{(1-x^2)^2}$ | d) $\frac{x}{(1-x)^2}$ | e) $\frac{x}{(1+x)^3}$ |
|------------------------|------------------------|--------------------------|------------------------|------------------------|

3) .

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|--|--|
| a) $\sum_{n=0}^{\infty} x^n, \quad x < 1$ | b) $\sum_{n=0}^{\infty} (-1)^n x^n, \quad x < 1$ |
| c) $\sum_{n=0}^{\infty} (-1)^n x^{2n}, \quad x < 1$ | d) $\sum_{n=0}^{\infty} (-1)^n (x+2)^n, \quad x < 1$ |
| e) $\sum_{n=1}^{\infty} (-1)^{n-1} \frac{(x+2)^n}{n}, \quad -3 < x < -1$ | f) $\sum_{n=1}^{\infty} n x^{n-1}, \quad x < 1$ |
| g) $\sum_{n=0}^{\infty} \frac{x^{n+1}}{n+1}, \quad -1 \leq x < 1$ | h) $\sum_{n=1}^{\infty} (-1)^{n-1} \frac{x^n}{n} \quad -1 < x \leq 1,$ |
| i) $\sum_{n=0}^{\infty} 2 \frac{x^{2n+1}}{2n+1}, \quad x < 1$ | j) $\sum_{n=0}^{\infty} (-1)^n \frac{x^{2n+1}}{2n+1}, \quad -1 \leq x \leq 1$ |
| k) $\sum_{n=1}^{\infty} (-1)^n 2n x^{2n-1}, \quad x < 1$ | l) $\sum_{n=0}^{\infty} (-1)^n e^{2n+1} \frac{x^{2n+1}}{2n+1}, \quad -\infty < x < 0.$ |

4) .

a) $\sum_{n=0}^{\infty} \frac{x^n}{n!}, \quad I = \mathbb{R}$

b) $\sum_{n=0}^{\infty} (-1)^n \frac{x^{2n}}{(2n)!}, \quad I = \mathbb{R}$

c) $\sum_{n=0}^{\infty} (-1)^n \frac{x^{2n+1}}{(2n+1)!}, \quad I = \mathbb{R}$

d) $\sum_{n=0}^{\infty} \frac{x^{2n}}{(2n)!}, \quad I = \mathbb{R}$

e) $\sum_{n=0}^{\infty} \frac{x^{2n+1}}{(2n+1)!}, \quad I = \mathbb{R}$

f) $\sum_{n=1}^{\infty} (-1)^n \frac{x^{2n+1}}{2n+1}, \quad |x| \leq 1$

g) $\sum_{n=0}^{\infty} (-1)^n \frac{x^n}{n!}, \quad I = \mathbb{R}$

h) $\sum_{n=1}^{\infty} (-1)^n \frac{x^{2n}}{(2n+1)!},$

5) .

a) $\sum_{n=1}^{\infty} (-1)^{n-1} \frac{x^{n-1}}{n}$

b) $\sum_{n=1}^{\infty} -\frac{x^{n-1}}{n}$

c) $\sum_{n=0}^{\infty} (-1)^n \frac{x^{4n+1}}{2^{2n+2}(4n+1)}$

d) $\sum_{n=0}^{\infty} (-1)^n \frac{x^{2n+1}}{(2n+1)n!}$

e) $\sum_{n=0}^{\infty} (-1)^n \frac{x^{n+2}}{(n+2)n!}$

f) $\sum_{n=0}^{\infty} (-1)^n \frac{x^{6n}}{(2n)!}$

9) .

a) $y = 2e^{-x}$

b) $y = e^x$

c) $y = \cosh x + 2\operatorname{senh}x$

d) $y = 1 + x^2$

e) $y \equiv 0$