KIT
DE
SOBREVIVÊNCIA

PARTE III

- RESPOSTAS DOS EXERCÍCIOS -

SUMÁRIO

Respostas dos exercícios sobre Fatoração

I)

$a) x^2 - x - 12$

$b) x^2 - 8x + 12$

$c) x + \sqrt{x} - 2$

$d) x^3 + 2x^2 - 4x - 8$

$e) x - 4$

$f) a^3 - 125$

$g) 2x - 2y + ax + ay$

II)

$a) (x - 3).(x + 3)$

$b) (x + 2).(x^2 - 2x + 4)$

$c) (5r - 9r^2)(5r + 9r^2)$

$d) (x - 4).(x + 2)$

$e) (t - 3).(t^2 + 3t + 9)$

$f) (\sqrt{n} + 2).(\sqrt{n} - 2)$

$g) (a - 2).(a + 4)$

$h) 2ab(a + 2b)$

$i) (x - 1).(x^2 + 1)$

$j) (a + b).(x + 2)$

$k) (y^2 - 10y).(y^2 + 10y)$

$l) \left(h + \frac{1}{5}\right)^2$

$m) \left(z + \frac{1}{3}\right)\left(z - \frac{1}{3}\right)$

$n) (t^2 + \sqrt{7}).(t^2 - \sqrt{7})$

III)

$a) x - 3$

$b) \frac{x - 4}{2}$

$c) \frac{x}{2}$

$d) a - 1$

$e) \frac{t + 2}{t}$

$f) x - \sqrt{2}$

$g) \frac{1}{y - 1}$

$h) x + 2$

$i) x + 5$

$i) a - 5$

Respostas dos exercícios sobre Frações

A)

1) $\frac{x^2 - 2x + 4}{4x - 8}$

2) $\frac{x^2 + 3x + 1}{x}$

3) $\frac{-3x^2 + 4x - 8}{2x^2 - 4x}$

4) $\frac{10x^2 + 15x - 2}{3 + 2x}$

5) $\frac{x - 1}{x^2 + x - 6}$

6) $\frac{3x^2 + 16x + 18}{3x + 6}$

7) $\frac{-x^2 + 6x - 4}{4x - 16}$

8) $\frac{-3x^2 - 9x + 14}{x^2 - x - 6}$

9) $\frac{-3x^2 + 15x - 4}{6x}$

10) $\frac{-15x^2 - 5x^3 + 4x}{4x^2 + 12x}$

11) $x + 2x - 3$

12) $\frac{1}{x - 1}$

13) $\frac{1}{x + 2}$

14) $\frac{x^2 + 2x + 2}{x + 1}$

15) $\frac{-5x - 12}{x + 3}$

21) $\frac{x + 3}{3}$

22) $\frac{x + 1}{x}$

23) $\frac{x + y}{xy}$

24) $\frac{-3x - 2}{8 + 4x}$

25) $\frac{x^2 y}{y^2 - x^2}$

26) $\frac{x^2 - 5x + 10}{4x - 8}$

27) $\frac{x - y}{x}$

16) $\frac{12x^2+8x+15}{10}$

17) $x-1$

18) $\frac{16x+1}{3x^2+3x}$

19) $\frac{5+8x^2}{x}$

20) $\frac{x^2+5x+3}{3x}$

B)

a) $4ab$

b) $\frac{c}{3b^2}$

c) $\frac{3x}{2}$

d) $x-3$

e) x

f) $x-1$

g) $2x$

h) $y-3$

i) 2

j) $a+1$

k) $2t+2$

l) $\frac{3}{m+2}$

C)

a) $\frac{9a}{m}$

b) $\frac{5y}{x^2}$

c) $\frac{3a}{2b}$

d) $\frac{2x}{x^2-a^2}$

e) $\frac{5a-27}{a^2-9}$

f) $\cdot\frac{6x+1}{2x^2y^2}$

g) $\frac{6x^4}{5a^3}$

h) $\frac{a^2-b^2}{a^2-9}$

i) $\frac{x}{a}$

j) $\frac{7a+21}{12}$

k) $\frac{x}{5}$

l) $\frac{n-3}{n}$

m) $\frac{2n^2-7n-5}{n^2-1}$

Respostas dos exercícios sobre Potenciação

1)

a) $\frac{1}{x^4+2ax^2+a^2}$

b) $\frac{1}{b^2}+\frac{2x^3}{b}+x^6$

h) $\frac{1}{p^{\frac{25}{4}}}$

i) $-q^3$

j) $\frac{1}{(r+1)^{\frac{2}{3}}}$

k) a^x

l) a^2

m) 1

n) $1+3y$

c) P^{14}

d) x^2

e) $\frac{1+y^4}{y^2}$

f) $x^2+2xy+y^2$

g) x^3y^3

2)

a) 10^{x-3}

b) 2^{x+3}

c) 3^2

d) $10^{\frac{-3x}{2}}$

e) 5^{4x}

f) $(y+4)^{-1}$

g) $2^{2-\frac{x}{2}}$

h) $6^{\frac{x}{4}}+6^{\frac{1}{2}}$

i) 5^2

j) 2

3)

a) $\frac{8a^6}{125}$

b) $\frac{1}{x^{15}}$

c) $27x^6$

d) $-x^{10}y^{10}$

e) $9x^6$

f) $-x^3y^6$

g) $-32a^{10}b^{10}c^5$

h) 16

i) 25

j) $64a^4m^2$

k) 81

l) 1

4) 32

5) $\frac{1}{a^n}$

6) 5^{68}

Respostas dos exercícios sobre Radiciação

1)

a) $\sqrt[5]{4}$

b) $\sqrt[3]{5^2}$

c) $\sqrt[3]{(ab)^2}$

d) $\sqrt[4]{\frac{125}{27}}$

e) $\sqrt{0,1}$

2)

a) $\sqrt[4]{2^3}$

b) $\sqrt[5]{5}$

c) $\sqrt[3]{3}$

d) - 3

e) 2

f) - 12

3)

a) $\sqrt[4]{10}$

b) $\sqrt[10]{2}$

c) $\sqrt[12]{5}$

d) $\sqrt[20]{7}$

e) $\sqrt[20]{6}$

f) $\sqrt[12]{10}$

4)

a) $\sqrt{91}$

b) $\sqrt[7]{52}$

c) $\sqrt[10]{x^7 y^3}$

d) $\sqrt[6]{a^5 b^2}$

e) $\sqrt[9]{10\,x^2 y^4}$

f) $\sqrt[3]{x^7}$

g) 7x

5)

a) $\frac{\sqrt{25}}{\sqrt{9}}$

b) 6

c) 2

d) $\frac{\sqrt[5]{2^4}}{\sqrt[5]{3^2}}$

e) $\frac{\sqrt[10]{27}}{\sqrt[10]{11}}$

6)

a) $\sqrt[3]{49}$

b) $2\sqrt[5]{2^2}$

c) $4\sqrt[5]{3^2}$

d) $\sqrt[6]{5^5}$

e) $2\sqrt[7]{5^3}$

f) $\sqrt[5]{m^4}$

g) $\sqrt[7]{x^6}$

h) 4

7)

a) $\frac{\sqrt{2}}{2}$

b) $\frac{\sqrt{15}}{15}$

c) $\frac{\sqrt{3}}{12}$

d) $\frac{\sqrt{10}}{2}$

e) $\frac{\sqrt{6}}{3}$

f) $\frac{5\sqrt{7}}{7}$.

g) $\frac{\sqrt{21}}{2}$

h) $\frac{\sqrt{10}+5}{10}$

Respostas dos exercícios sobre Inequações

1)

a) (-∞;0) U (1;+∞)

2)

a) $(-\infty;-3) \cup (2;+\infty)$

b) $\left(-\infty;\frac{1}{2}\right) \cup (2;+\infty)$

c) $[-3;2)$

d) $\left[1;\frac{2}{3}\right)$

e) $(-\infty;-1] \cup \left(\frac{1}{3};+\infty\right)$

f) (-2;-1)

g) $(-\infty;-4) \cup (-2;+\infty)$

h) $(-\infty;1) \cup (3;+\infty)$

i) $(-\infty;-3) \cup (1;+\infty)$

j) $\left(-\infty;-\frac{1}{2}\right) \cup (3;+\infty)$

k) $\mathbb{R}$

l) $(-\infty;-3] \cup [3;+\infty)$

m) $\left(-\infty;\frac{1}{3}\right] \cup \left[\frac{5}{2};+\infty\right)$

n) $(-\infty;-1] \cup [2;+\infty)$

o) $(-1;1) \cup (3;+\infty)$

p) $(-\infty;1) \cup (2;4)$

q) $\left(\frac{1}{2};1\right) \cup (3;+\infty)$

r) $[0;1] \cup (2;+\infty)$

s) $(-3;4)$

t) $\left[\frac{2}{3};4\right)$

b) $\left[\frac{1-\sqrt{5}}{2};\frac{1+\sqrt{5}}{2}\right]$

c) (0;2] U (3;+∞)

d) [2;3] U [4;+∞)

e) (-2;-$\sqrt{2}$) U ($\sqrt{2}$;2)

f) ∅

g) (-∞;1) U (3;+∞)

h) $(-3;1)$

i) $\left[-\frac{1}{2};2\right]$

j) (-∞;-3] U [2;+∞)

k) (-4;1) U (2;+∞)

l) (-1;0) U (1;+∞)

m) $\left(-\infty;\frac{1}{2}\right)\cup\left(\frac{2}{3};3\right)$

n) $(-\infty;-1)\cup(1;+\infty)$

o) $(-\infty;-1]\cup\left(\frac{2}{3};+\infty\right)$

p) $\left(-4;\frac{1}{2}\right)$

q) $\left(-2;\frac{3}{2}\right]$

r) $(-\infty;3)\cup(1;+\infty)$

s) $(-\infty;-3)\cup(2;+\infty)$

t) $(-\infty;-3)\cup(2;+\infty)$

2)

u) $(1;2]$

v) $(-\infty;0)\cup\left(\frac{1}{2};+\infty\right)$

w) $(-3;1)\cup(5;+\infty)$

x) $(-\infty;0]\cup(1;4]$

3)

a) $\left(-\infty;\frac{3}{4}\right)\cup(2;+\infty)$

b) $(-\infty;1]\cup(2;+\infty)$

c) $\left(-\infty;-\frac{1}{2}\right)\cup\left[\frac{2}{3};+\infty\right)$

d) $(-\infty;0)\cup[1;+\infty)$

e) $(-\infty;-5)$

f) $(-\infty;0)\cup(1;+\infty)$

4) $(-1;0]\cup(1;+\infty)$

5)

a) -15

b) -3

c) 11

d) 4

e) $\frac{5}{2}$

f) 10

g) $4-\pi$

h) $4-\pi$

i) $1{,}2-\sqrt{2}$

j) $\sqrt{3}-1{,}7$

k) $\sqrt{3}-1{,}7$

l) $\frac{1}{3}-\frac{1}{5}$

m) $3+x$

n) $x-5$

o) $2-x$

p) $7+x$

6)

a) $(-3{,}01;-2{,}99)$

b) $(-\infty;-2,001) \cup (-1,999;+\infty)$

c) $\left(-\frac{9}{2};-\frac{1}{2}\right)$

d) $\left[\frac{3}{5};\frac{9}{5}\right]$

e) $[3,97;4,03]$

f) $(-\infty;2,998) \cup (3,002;+\infty)$

g) $\left(-\infty;\frac{2}{3}\right] \cup [4;+\infty]$

h) $\left(-\infty;-\frac{17}{4}\right) \cup \left(-\frac{5}{7};+\infty\right)$

Respostas dos exercícios sobre Domínio

1)

a) Dom f: $\Re - \{5\}$

b) Dom f: $\Re - \{0\}$

c) Dom f: $\Re - \{+2,-2\}$

d) Dom f: $\Re - \left\{\frac{1}{2}\right\}$

e) Dom f: $\Re - \{4,5\}$

f) Dom f: $\Re - \{0,-3\}$

g) Dom f: $\Re$

h) Dom f: $\Re - \{+\sqrt{3},-\sqrt{3}\}$

i) Dom f: $\left(-\infty;\frac{1}{3}\right]$

2) Dom f: $[1;+\infty)$

3)

a) Dom f: $\Re - \{1,3,-3\}$

b) Dom f: $\left[\frac{1}{2};+\infty\right)$

c) Dom f: $(2;+\infty)$

d) Dom f: $(-1;+\infty)$

e) Dom f: $\Re - \{-5,0\}$

f) Dom f: $(0;+\infty)$

g) Dom f: $\{x \in \Re / x > -4, x \neq 2, x \neq -2\}$

4)

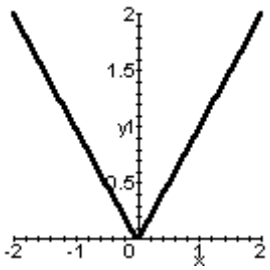
Dom f: $\{x \in \Re / -2 \leq x < 5, x \neq -3, x \neq 3\}$

Respostas dos exercícios sobre Funções

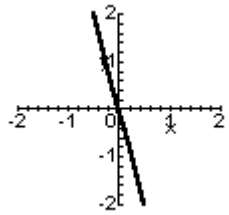
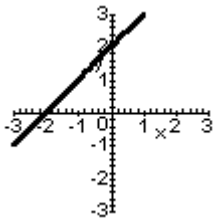
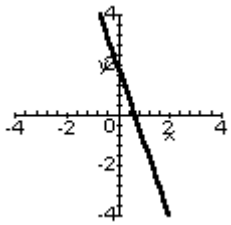
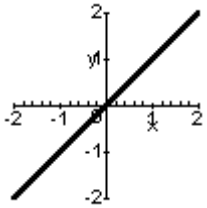
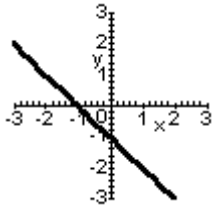
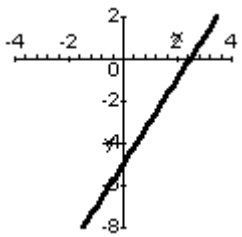
1)

Dom f: $\Re$

Im f : $\Re$

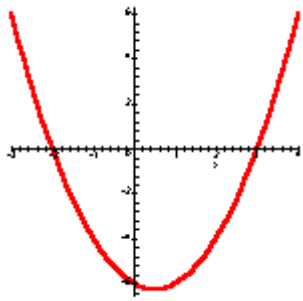
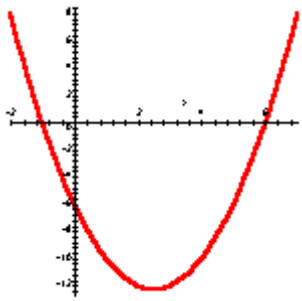
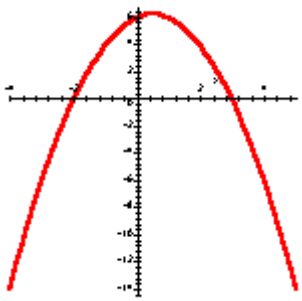
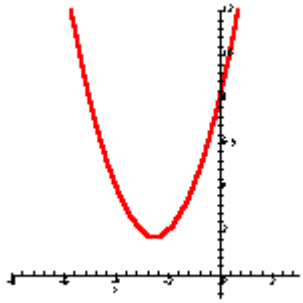
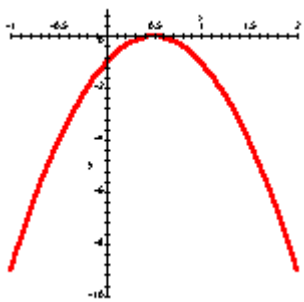
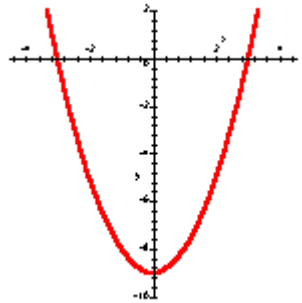


2)

a) y = -4x 	b) y = x + 2 	c) y = -3x + 2 
d) y = x 	e) y = -x - 1 	f) y = 2x - 5 

3) a) {0} b) {-3} c) {4} d) $\left\{-\frac{1}{4}\right\}$ e) {1} f) $\left\{\frac{4}{5}\right\}$

4)

a) $y = x^2 - x - 6$  {-2, 3}	b) $y = x^2 - 5x - 6$  {-1, 6}	c) $y = -x^2 + x + 6$  {-2, 3}
d) $y = x^2 + 5x + 8$  não existem raízes reais	e) $y = -4x^2 + 4x - 1$  $\left\{\frac{1}{2}\right\}$	f) $y = x^2 - 9$  {-3, 3}

5) R = 91 6) R = -2 7) S = $\left\{\frac{1}{2}\right\}$ 8) m = $\frac{7}{3}$

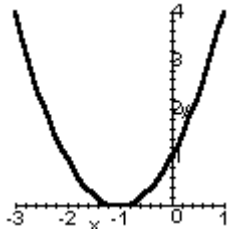
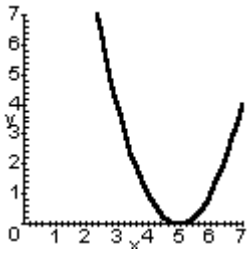
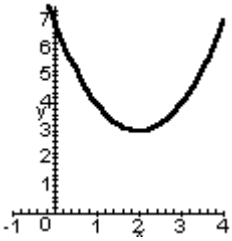
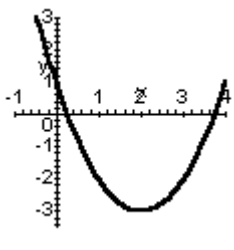
9)

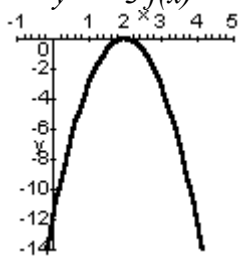
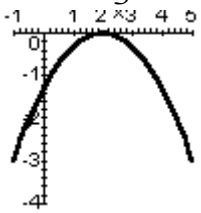
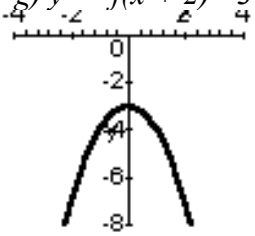
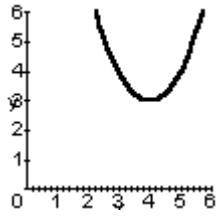
Função	f(x) < 0	f(x) = 0	f(x) > 0	Crescimento
a) f(x) = x + 5	x < -5	x= -5	x > -5	crescente
b) y = - 3x + 9	x > 3	x = 3	x < 3	decrescente
c) f(x) = 2 - 3x	$x > \frac{2}{3}$	$x = \frac{2}{3}$	$x < \frac{2}{3}$	decrescente
d) f(x) = 2x + 5	$x < -\frac{5}{2}$	$x = -\frac{5}{2}$	$x > -\frac{5}{2}$	crescente
e) y = - 3x + 5	$x > \frac{5}{3}$	$x = \frac{5}{3}$	$x < \frac{5}{3}$	decrescente
f) g(x) = 1 - 5x	$x > \frac{1}{5}$	$x = \frac{1}{5}$	$x < \frac{1}{5}$	decrescente
g) $y = \frac{x}{3} - 1$	x < 3	x = 3	x > 3	crescente
h) $f(x) = 2 + \frac{x}{2}$	x < -4	x = -4	x > -4	crescente

10)

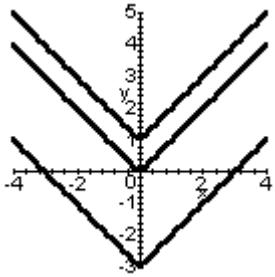
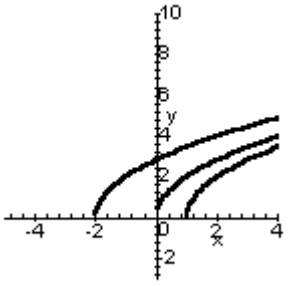
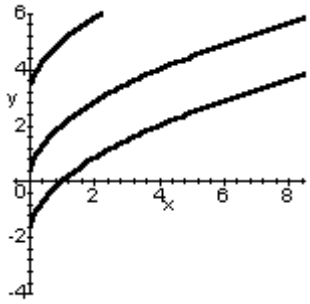
Função	f(x) < 0	f(x) = 0	f(x) > 0	Crescimento
a) $f(x) = x^2 - 3x - 10$	-2 < x < 5	x=-2 ou x=5	x<-2ou x>5	$\left(-\frac{49}{4};+\infty\right)$
b) $f(x) = -6x^2 + x + 1$	$x < -\frac{1}{3}$ ou $x > \frac{1}{2}$	$x = \frac{1}{2}$ ou $x = -\frac{1}{3}$	$-\frac{1}{3} < x < \frac{1}{2}$	$\left(-\infty;\frac{25}{4}\right)$
c) $f(x) = x^2 - 9$	-3<x<3	x=-3 ou x=3	x<-3 ou x>3	$(-9;+\infty)$
d) $f(x) = -x^2 + 2x$	x<0 ou x>2	x=0 ou x=2	0<x<2	$(-\infty;1)$
e) $f(x) = x^2 - x + 10$	não tem raízes	não tem raízes	$\Re$	$\left(\frac{39}{4};+\infty\right)$
f) $f(x) = -4x^2 + 3x - 6$	$\Re$	não tem raízes	não tem raízes	$\left(-\infty;-\frac{87}{16}\right)$
g) $f(x) = x^2 - 4$	x<-2 ou x>2	x=-2 ou x=2	-2<x<2	$(-4;+\infty)$

11)

a) y = f(x + 3) 	*b) y = f(x - 3)* 
y = f(x) + 3 	*d) y = f(x) - 3* 

y = - 3·f(x) 	*f)* $y = -\frac{1}{3} f(x)$ 
g) y = -f(x + 2) - 3 	*h) y = f(x - 2) + 3* 

12)

a) f(x) = |x| + c; c = 0, 1, -3 	*b)* $f(x) = 2\sqrt{x-c}$ *; c = 0, 1, -2* 
c) $f(x) = 2\sqrt{x}+c$ *; c = 0, 3, -2* 	*d)* $f(x) = -2(x - c)^2$*; c = 0, 1, -2*