CM300 - Introdução ao Cálculo
Lista de Exercícios 1

1. Expresse cada número abaixo na forma decimal (pode usar uma calculadora).

   (a) $\frac{1}{4}$ (b) $-\frac{250}{8}$ (c) $-\frac{3}{160}$ (d) $\frac{4}{11}$ (e) $-\frac{30}{7}$ (f) $\frac{560}{14}$ (g) $\frac{7}{8}$

   (h) $\frac{8}{7}$ (i) $\frac{200}{3}$ (j) $-\frac{4}{5}$

2. Simplifique o máximo possível cada uma das frações, deixando-as na forma irredutível.

   (a) $\frac{42}{70}$ (b) $-\frac{22}{99}$ (c) $\frac{24}{18}$ (d) $-\frac{66}{78}$ (e) $\frac{360}{150}$ (f) $\frac{72}{84}$ (g) $-\frac{225}{60}$

3. Efetue as operações indicadas em cada item, expressando o resultado como uma fração irredutível.

   (a) $\dfrac{\frac{1}{2}\cdot\frac{2}{3}}{\frac{3}{4}-\frac{1}{5}}$ (b) $\dfrac{\frac{3}{4}}{-\frac{3}{4}}$ (c) $\dfrac{\frac{3}{4}}{-\frac{4}{3}}$ (d) $\frac{3}{2}+\frac{1}{3}$ (e) $\frac{2}{3}+\frac{3}{2}-\frac{10}{3}$

   (f) $\left(-\frac{2}{5}\right)\left(-\frac{2}{5}\right)+\frac{1}{5}$ (g) $\frac{100}{3}-\frac{1}{7}+\frac{1}{21}$ (h) $\left(-\frac{7}{2}\right)\left(-\frac{7}{3}\right)\left(-\frac{7}{4}\right)$

   (i) $-\frac{7}{2}-\frac{7}{3}-\frac{7}{4}$ (j) $\dfrac{\frac{1}{5}}{\frac{2}{5}+\frac{3}{5}}$ (k) $\dfrac{\frac{2}{5}+\frac{3}{5}}{\frac{1}{5}}$ (l) $\dfrac{\frac{1}{2}+\frac{1}{3}+\frac{1}{4}}{\frac{1}{5}}$

4. Escreva as expressões abaixo na forma expandida.

   (a) $(x+3)^2$ (b) $(x+4)(x-4)$ (c) $(y-7)^2$ (d) $x^2(2x+4)(2x-4)$

   (e) $(5x-1)^2$ (f) $(x^2+x)^2$ (g) $(-x-1)^2$ (h) $2x(x^2+3)$ (i) $(x+2x^2+1)(2x+3)$

5. Fatore o máximo possível as expressões abaixo.

   (a) x^2+6x+9 (b) $4x^2-4x+1$ (c) x^2-16 (d) x^4-1 (e) $25x^7-4x$

   (f) $8x^3+6x^2+2x^4$ (g) $7x^6-28x^4+28x^2$ (h) $x^{100}+4x^{60}+4x^{20}$ (i) $4x^7+12x^5+9x^3$

Respostas:

1. (a) $0,25$ (b) $-31,25$ (c) $0,01875$ (d) $0,\overline{36}$ (e) $-4,\overline{285714}$
   (f) 40 (g) $0,875$ (h) $1,\overline{142857}$ (i) $66,\overline{6}$ (j) $-0,8$

2. (a) $\frac{3}{5}$ (b) $-\frac{2}{9}$ (c) $\frac{4}{3}$ (d) $-\frac{11}{13}$ (e) $\frac{12}{5}$ (f) $\frac{6}{7}$ (g) $-\frac{15}{4}$

3. (a) $\frac{20}{33}$ (b) -1 (c) $-\frac{9}{16}$ (d) $\frac{11}{6}$ (e) $-\frac{7}{6}$ (f) $\frac{9}{25}$ (g) $\frac{698}{21}$
   (h) $-\frac{343}{24}$ (i) $-\frac{91}{12}$ (j) $\frac{1}{5}$ (k) 5 (l) $\frac{65}{12}$

4. (a) x^2+6x+9 (b) x^2-16 (c) $y^2-14y+49$ (d) $4x^4-16x^2$
   (e) $25x^2-10x+1$ (f) $x^4+2x^3+x^2$ (g) x^2+2x+1 (h) $2x^3+6x$
   (i) $4x^3+8x^2+5x+3$

5. (a) $(x+3)^2$ (b) $(2x-1)^2$ (c) $(x+4)(x-4)$
   (d) $(x^2+1)(x-1)(x+1)$ (e) $x(5x^3+2)(5x^3-2)$
   (f) $2x^2(4x+3+x^2)$ (g) $7x^2(x^2-2)^2$ (h) $x^{20}(x^{40}+2)^2$ (i) $x^3(2x^2+3)^2$