**Atividade a)**

**Código fonte:**

|  |
| --- |
| % limpa variavel/console  clear**;**  clc**;**  % Variaveis  f\_0 **=** 500**;** # Frequencia do sinal **[**Hz**]**  f\_s **=** 8e3**;** # Frequencia de amostragem **[**Hz**]**  n **=** 3**;** # Numero de periodos  % Calculo  t\_max **=** n**/**f\_0 **-** 1**/**f\_s**;**  t **=** 0**:**1**/**f\_s**:**t\_max**;**  x **=** cos**(**2**\***pi**\***f\_0**\***t**);**  % Plotagem  figure**(**1**);**  stem**(**t**,** x**,** '.'**);**  title**(**'x(t)'**);**  X **=** fft**(**x**);**  N **=** length**(**x**);**  k **=** 0**:**N**-**1**;**  w **=** k**\***2**\***pi**/**N**;**  f **=** w**\***f\_s**/(**2**\***pi**);**  % Plotagem  figure**(**2**);**  subplot**(**3**,** 1**,** 1**);**  stem**(**k**,** abs**(**X**),** '.'**);**  title**(**'|X(k)|'**);**  axis tight**;**  subplot**(**3**,** 1**,** 2**);**  stem**(**w**,** abs**(**X**),** '.'**);**  title**(**'|X(w)|'**);**  axis tight**;**  subplot**(**3**,** 1**,** 3**);**  stem**(**f**,** abs**(**X**),** '.'**);**  title**(**'|X(f)|'**);**  axis tight**;**  ind **=** 1**:**N**/**2**+**1**;**  hold on**;**  stem**(**f**(**ind**),** abs**(**X**(**ind**)),** '.'**);**  hold off**;**  % Atividade b)  delta\_w = 2\*pi/N  delta\_f = f\_s/N |

**Resultados da simulação:**

|  |  |  |
| --- | --- | --- |
| ***f*0** | ***f*1** | ***f*2** |
| 100 Hz | 100 | 7900 |
| 500 Hz | 500 | 7500 |
| 1 kHz | 1000 | 7000 |
| 2 kHz | 1000 | 6000 |

**Gráficos:**

* **100 Hz:**

|  |  |
| --- | --- |
|  |  |

* **500 Hz:**

|  |  |
| --- | --- |
|  |  |

* **1 kHz:**

|  |  |
| --- | --- |
|  |  |

* **2 kHz:**

|  |  |
| --- | --- |
|  |  |

**Atividade b)**

|  |  |  |
| --- | --- | --- |
| ***N*período** | **Δ*ω*** | **Δ*f*** |
| 2 | 0,1963 | 250,00 |
| 4 | 0,0982 | 125,00 |
| 8 | 0,0491 | 62,50 |
| 16 | 0,0245 | 31,25 |