Importing the required packages

In [14]:
```
import numpy as np
import matplotlib.pyplot as plt
from astropy.io import fits
from astropy.table import Table
from astropy import units as u
plt.ion()
import os
```

Tests with astropy units

- **Assign variable *a* a value with units**
- **Assign variable *b* an array with units**
- **Print *a* and *b***

In [15]:
```
a = 50.0 * u.meter
b = [23, 45, 88] * u.meter
print(a)
print(b)
```

```
50.0 m
[23. 45. 88.] m
```

- **Find mean value of *b***

In [16]:
```
np.mean(b)
```

Out[16]: $52\ \mathrm{m}$

- **Test arithmetic operations with units**

In [29]:
```
15 * u.meter / (3 * u.second)
```

Out[29]: $5\ \frac{\mathrm{m}}{\mathrm{s}}$

- **Assign *x* and *y* values with units**

In [18]:
```
x = 62 * u.parsec
print(x)
```

```
62.0 pc
```

In [19]:
```
y = 45 * u.parsec
```

- **Show that the ratio *x/y* is dimensionless**

In [20]:
```
x/y
```

Out[20]: 1.3777778

- **Get only the magnitude of *x***

In [21]:
```
z = x.value
print(z)
```

```
62.0
```

In [22]:
```
z = x.value/y.value
```

In [23]:
```
z
```

Out[23]:
```
1.3777777777777778
```

- **Use np.around to round up the result**

In [24]:
```
np.around(z, decimals=2)
```

Out[24]:
```
1.38
```

- **Get the type of *x***

In [25]:
```
type(x)
```

Out[25]:
```
astropy.units.quantity.Quantity
```

- **Assign variable *c* an array with units**

In [26]:
```
c = [4, 7, 10] * u.second
```

- **Generate a displacement vs time graph**

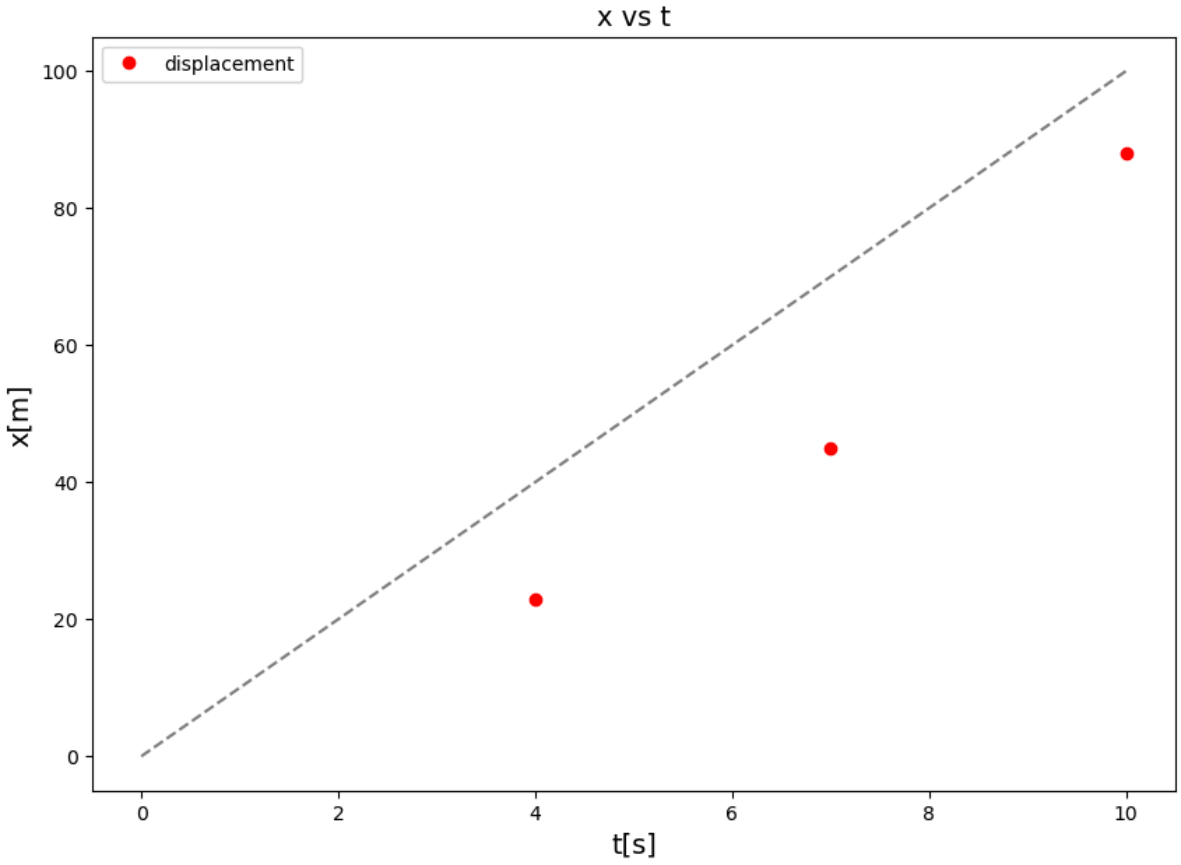
  Here variable *c* stores our time values and variable *b* stores our displacement values

- **Compare the measured values to uniform motion**

In [27]:
```
plt.figure(figsize=[10,7])
plt.plot(c, b, ls="", color="r", marker='o', label='displacement')
plt.xlabel("t[s]", fontsize=14)
plt.ylabel("x[m]", fontsize=14)
plt.title("x vs t", fontsize=14)
plt.legend()

l1 = np.linspace(0, 10, 10)
l2 = np.linspace(0, 100, 10)
plt.plot(l1,l2,color='gray',ls="--")
```

Out[27]:
```
[<matplotlib.lines.Line2D at 0x114255510>]
```



In [ ]: