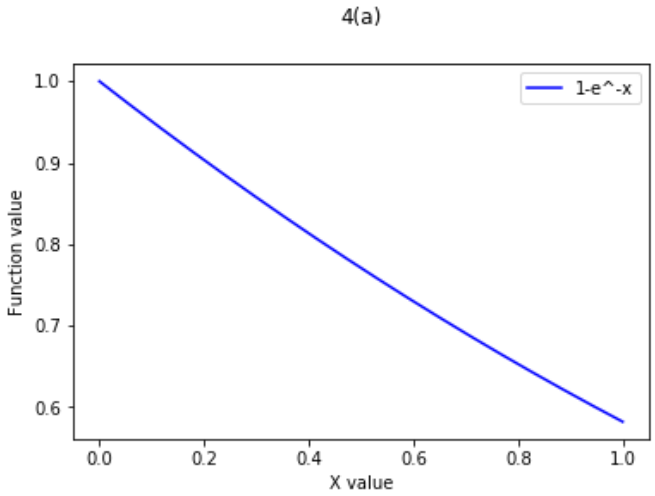
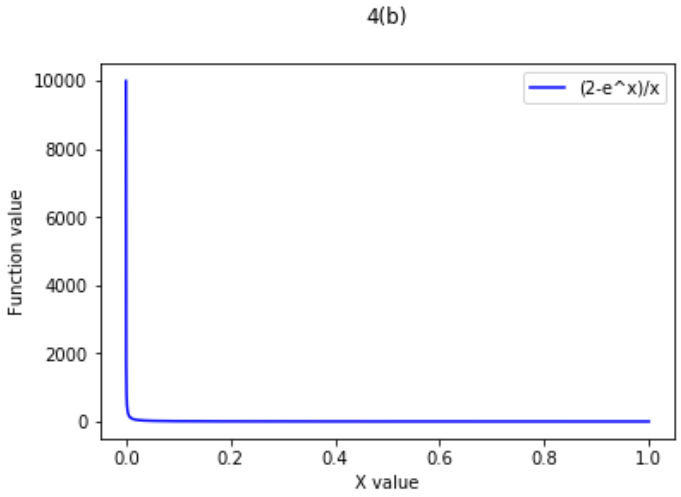
In [10]:
```
import numpy as np
import matplotlib.pyplot as plt
from matplotlib import colors
import math
import seaborn as sns

np.set_printoptions(threshold=np.nan)

dt = 0.000001
N = 1/dt - 1
array = np.zeros(int(N))
new_array = array
x = 0.000001
x_values = np.zeros(int(N))
i = 0


while x < 1:
    array[i] = x * math.exp(-x) / (1 - math.exp(-x))
    x_values[i] = x
    x = x + dt
    i = i +1




# plotting the points
plt.plot(x_values, new_array, color = 'blue')
plt.legend(['1-e^-x'])

# naming the x axis
plt.xlabel('X value')
# naming the y axis
plt.ylabel('Function value')

# giving a title to my graph
plt.title('4(a)', y = 1.08)

# function to show the plot
plt.show()
plt.close()
```



It is less than 1 everywhere on [0,1]

In [36]:
```
import numpy as np
import matplotlib.pyplot as plt
from matplotlib import colors
import math
import seaborn as sns

dt = 0.0001
N = 1/dt - 1
array = np.zeros(int(N+1))
x = 0.0001
x_values = np.zeros(int(N+1))
i = 0


while x < 1.0:

    array[i] = math.exp(x) / x
    x_values[i] = x
    if abs(x - 0.0645) < 0.00001:
        print("x = %f" %x)
        print(array[i])
    x = x + dt
    i = i +1

print('Minimum value (at x = 1):')
print(array[i-1])



# plotting the points
plt.plot(x_values, array, color = 'blue')
plt.legend(['(2-e^x)/x'])

# naming the x axis
plt.xlabel('X value')
# naming the y axis
plt.ylabel('Function value')

# giving a title to my graph
plt.title('4(b)', y = 1.08)

# function to show the plot
plt.show()
```

```
x = 0.064500
16.536830670459473
Minimum value (at x = 1):
2.718281828459045
```




```
All values are greater than 1
```

In [ ]: