In [1]:
```
import numpy as np
import matplotlib.pyplot as plt
import json
```

Вывод на кластере (чистый MPI)

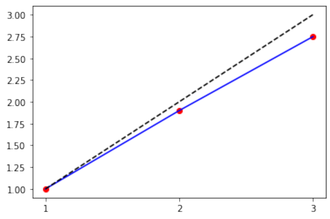
compute-0-0
np: 1
Jacobi (MPI_Send_init + MPI_Recv_init)
Number of iterations: 4225
Time: 131.568
Error: 4.1795e-05

compute-0-2
compute-0-1
np: 2
Jacobi (MPI_Send_init + MPI_Recv_init)
Number of iterations: 4225
Time: 69.2804
Error: 4.1795e-05

compute-0-2
compute-0-1
compute-0-0
np: 3
Jacobi (MPI_Send_init + MPI_Recv_init)
Number of iterations: 4225
Time: 47.8819
Error: 4.1795e-05

In [2]:
```
time = np.array([131.568, 69.2804, 47.8819])
acceleration = time[0] / time

ax = plt.subplot(1, 1, 1)
ax.scatter(range(1, 4), acceleration, color='r')
ax.plot(range(1, 4), acceleration, color='b')
ax.plot(range(1, 4), range(1, 4), '--', color='k')
plt.xticks(range(1, 4))
plt.show()
print(json.dumps({i+2: f'{x:.3f}' for i, x in enumerate(acceleration[1:])}, indent=4).replace('\"',''))
```




```
{
    2: 1.899,
    3: 2.748
}
```

Вывод на кластере (MPI внутри одной машины)

- np: 1

Zeidel (MPI_Send_init + MPI_Recv_init) Number of iterations: 37 Time: 1.23495 Error: 1.50152e-07

- np: 2

Zeidel (MPI_Send_init + MPI_Recv_init) Number of iterations: 37 Time: 0.681489 Error: 1.74004e-07

- np: 3

Zeidel (MPI_Send_init + MPI_Recv_init) Number of iterations: 37 Time: 0.479683 Error: 1.50152e-07

- np: 4

Zeidel (MPI_Send_init + MPI_Recv_init) Number of iterations: 37 Time: 0.371628 Error: 1.68064e-07

- np: 5

Zeidel (MPI_Send_init + MPI_Recv_init) Number of iterations: 38 Time: 0.470775 Error: 1.51838e-07

- np: 6

Zeidel (MPI_Send_init + MPI_Recv_init) Number of iterations: 38 Time: 0.521057 Error: 1.63408e-07

- np: 7

Zeidel (MPI_Send_init + MPI_Recv_init) Number of iterations: 38 Time: 0.562786 Error: 1.36497e-07

- np: 8

Zeidel (MPI_Send_init + MPI_Recv_init) Number of iterations: 37 Time: 0.58116 Error: 1.60622e-07

- np: 9

Zeidel (MPI_Send_init + MPI_Recv_init) Number of iterations: 37 Time: 0.613923 Error: 1.50152e-07

- np: 10

Zeidel (MPI_Send_init + MPI_Recv_init) Number of iterations: 38 Time: 0.623466 Error: 1.62074e-07

- np: 11

Zeidel (MPI_Send_init + MPI_Recv_init) Number of iterations: 39 Time: 0.650548 Error: 1.39433e-07

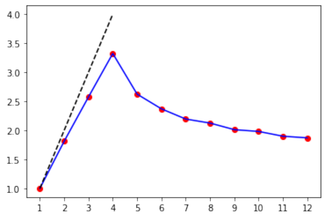
- np: 12

Zeidel (MPI_Send_init + MPI_Recv_init) Number of iterations: 38 Time: 0.66029 Error: 1.73107e-07

In [3]:
```
t = np.array([1.23495, 0.681489, 0.479683, 0.371628,
              0.470775, 0.521057, 0.562786, 0.58116,
              0.613923, 0.623466, 0.650548, 0.66029])
acc = t[0] / t
rng = range(1, len(acc) + 1)

ax = plt.subplot(1, 1, 1)
ax.scatter(rng, acc, color='r')
ax.plot(rng, acc, color='b')
ax.plot(rng[:4], rng[:4], '--', color='k')
plt.xticks(rng)
plt.show()

print('''
Zeidel (MPI_Send_init + MPI_Recv_init)
Number of iterations: 37
''')
print(json.dumps({i+2: f'{x:.3f}' for i, x in enumerate(acc[1:])}, indent=4).replace('\"',''))
```




```
Zeidel (MPI_Send_init + MPI_Recv_init)
Number of iterations: 37

{
    2: 1.812,
    3: 2.575,
    4: 3.323,
    5: 2.623,
    6: 2.370,
    7: 2.194,
    8: 2.125,
    9: 2.012,
    10: 1.981,
    11: 1.898,
    12: 1.870
}
```