EX.0.2.5, Sauer

Find the first 15 bits in binary representation of π.
(Hint: taking π as 3.1415 or 3.1416 produces the correct 15 first bits.)

EX.0.2.5, Sauer, solution, Langou

First,

$$(3)_{10} = (11)_2;$$

second,

$$(.1416)_{10} = (.0010010000111....)_2.$$

The latter because:

.1416
0.2832
0.5664
1.1328
0.2656
0.5312
1.0624
0.1248
0.2496
0.4992
0.9984
1.9968
1.9936
1.9872

and we read the bits on the leftmost column from top to bottom.

$$\pi = (11.0010010000111...)_2$$

Note: these are the 15 first bits of π however the 15 bits number the closest from π would be

$$(11.0010010001000...)_2$$