PIPEMASTER · IPC PLUMBING EXAM

The Ultimate Rolling Offset & Cut Deduction Cheat Sheet

Tape this to the inside of your truck door.

1 The standard rolling offset formula

A rolling offset changes elevation and horizontal direction at the same time.

```
True offset = √(Rise² + Roll²)
Travel (diagonal) = True offset × Constant
```

FITTING ANGLE	CSC (MULTIPLIER)	SIN (DIVIDER)
11.25°	5.13	0.195
22.5°	2.61	0.383
45°	1.414	0.707
60°	1.15	0.866

Most common in the field (45° fitting): Travel = True offset × 1.414

2 Required drainage slopes

Minimum grade for horizontal drainage pipe, by pipe size (IPC Table 704.1).

PIPE SIZE	SLOPE	GRADE
2-1/2" or smaller	1/4" per foot	2%
3" to 6"	1/8" per foot	1%
8" or larger	1/16" per foot	0.5%

3 Standard cut deductions

Always subtract the fitting allowance from your travel before cutting the pipe. Approximate centre-to-end deductions for standard PVC/ABS fittings:

PIPE SIZE	45° FITTING	90° FITTING
1-1/2"	1-1/8"	1-1/2"
2"	1-1/2"	1-7/8"
3"	1-3/4"	2-1/2"
4"	2-1/8"	3-1/4"

Deductions run from the centre of the fitting to the face of the hub or stop. Always measure your own brand of fitting.

Hate doing this maths by hand?

- Rolling offset, offset and drainage fall calculators that show every step
- 649 IPC exam practice questions, flashcards and a timed mock test
- Free in your browser, and it works offline once opened

xernaitech.com/pipemaster

A study and field aid. Check every figure against the code adopted where you work, its local amendments and the manufacturer's data before you rely on it.