Homework 10

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Semiconductor Development Fundamentals

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# 

## Fill in the following table.

|  |  |  |
| --- | --- | --- |
| 1000 Chips | | |
| **variable** | **Vendor A** | **Vendor B** |
| Photomask cost | $ 100,000.00 | $ 200,000.00 |
| Wafer diameter (cm) | 20 | 30 |
| Wafer cost | $ 3,000.00 | $ 6,000.00 |
| Defect density | 0.2 | 0.4 |
| Chip area (cm^2) | 1 | 0.5 |
| # chips / wafer | 20 | 60 |
| Yield | 0.818730753 | 0.818730753 |
| # good chips / wafer (round down) | 16 | 49 |
| # wafers required | 63 | 21 |
| Total run cost (wafers + photomask | $ 289,000.00 | $ 326,000.00 |
| Cost per chip (total run cost / 1000 chips) | $ 289.00 | $ 326.00 |

## Which vendor would you choose for the initial run?

Vendor A. It is cheaper.

# 

## Fill in the following table.

|  |  |  |
| --- | --- | --- |
| 1,000,000 Chips | | |
| **variable** | **Vendor A** | **Vendor B** |
| Photomask cost | $ 100,000.00 | $ 200,000.00 |
| Wafer diameter (cm) | 20 | 30 |
| Wafer cost | $ 3,000.00 | $ 6,000.00 |
| Defect density | 0.2 | 0.4 |
| Chip area (cm^2) | 1 | 0.5 |
| # chips / wafer | 20 | 60 |
| Yield | 0.818730753 | 0.818730753 |
| # good chips / wafer (round down) | 16 | 49 |
| # wafers required | 62500 | 20409 |
| Total run cost (wafers + photomask | $ 187,600,000.00 | $ 122,654,000.00 |
| Cost per chip (total run cost / 1000 chips) | $ 187.60 | $ 122.65 |

## Which vendor would you choose?

Vendor B. It is cheaper.