Cache Design Worksheet

Question 1: Direct Mapped

Parameters
- Main Memory: 1 GB
- Block/Line Size: 64 B
- Cache: 1 MB Direct Mapped

Questions
- How many main memory blocks are there?
- How many cache lines are there?
- How many memory blocks map to a single cache line?

- What is the address breakdown for RAM?

Block Index	Byte Offset

- What is the address breakdown for cache?

Tag	Line Index	Byte Offset

- Lookup Algorithm for Address X:

Question 2: Fully Associative

Parameters
- Main Memory: 1 GB
- Block/Line Size: 64 B
- Cache: 1 MB Fully Associative

Questions
- How many main memory blocks are there?
- How many cache lines are there?
- How many memory blocks map to a single cache line?

- What is the address breakdown for RAM?

Block Index	Byte Offset

- What is the address breakdown for cache?

Tag	Byte Offset

- Lookup Algorithm for Address X:

Question 3: Set-Associative

Parameters
- Main Memory: 1 GB
- Block/Line Size: 64 B
- Cache: 1 MB 8-way set associative

Questions
- How many main memory blocks are there?
  - How many cache lines are there?
  - How many cache lines per set are there?
  - How many cache sets are there?
- How many memory blocks map to a single cache set?

- What is the address breakdown for RAM?

Block Index	Byte Offset

- What is the address breakdown for cache?

Tag	Set Index	Byte Offset

- Lookup Algorithm for Address X: