Chapter 6 · Section 6.5 — Exercises (Mazidi)

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> Problems are paraphrased to respect copyright. Short derivations shown for each.

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53) If `LDR R2,[PC,#8]` is located at address 0x300, what memory address is accessed?

ARM state rule: `PC_effective = current_address + 8`.
Here: `PC_effective = 0x300 + 0x8 = 0x308`.
`EA = PC_effective + 0x8 = 0x308 + 0x8 = **0x310**`.

Answer: 0x00000310.

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54) Using PC-relative addressing, write an `LDR` that accesses a location 0x20 bytes ahead of itself.

We want `EA = current_address + 0x20 = (current_address + 0x8) + imm`.
Therefore `imm = 0x20 − 0x8 = 0x18`.

```
LDR     R2, [PC, #0x18]    ; accesses (this instruction address + 0x20)
```

(In Thumb state, use `#0x1C` because PC = addr + 4.)

Notes for learners

- `ADR Rd, label` emits a PC-relative add; `LDR Rd,=imm` is often assembled into a **literal load** via a PC-relative address.