Power problem set

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Attempt the following problems. Make sure to lay out your work well and give units (where relevant).

1. Calculate the voltage developed across a 6 kΩ resistor with 105 mA flowing through it.
2. The current on a server PSU's 5 V rail is measured as 4 A. What power is being delivered by the PSU?
3. Write an expression for P using only R and I.
4. A load consumes 60 W of power from a 12 V battery. Calculate the current.
5. A device requires 5 A at 230 V. Determine the apparent power.
6. A device consumes 720 W when connected to a 230 V supply. Determine the apparent power.
7. Two devices, A and B, operate on a 230 V supply. Device A consumes 650 W and has a power factor of 0.9. Device B consumes 450 W at an unknown power factor. Determine the apparent power.
8. An IT device has an apparent power requirement of 750 W. Its real power is 680 W. Determine:
   (a) Its power factor.
   (b) The reactive power component.
9. A SAN storage array consumes 1250W at 230V:
   (a) Find a suitable rackmount UPS from APC / Eaton for it.
   (b) Estimate runtime of your chosen UPS from specifications.
10. Write a script in PowerShell (or any other language) to do some / all of the following:
    (a) Work out the total apparent power for a number of devices.
    (b) Add in a catalogue of commonly used devices in your data centre.
    (c) Select a suitable UPS from a small catalogue (e.g. 3-5).

    Test your script using some of the problems above.